United States
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Rural
Utilities
Service

Informational
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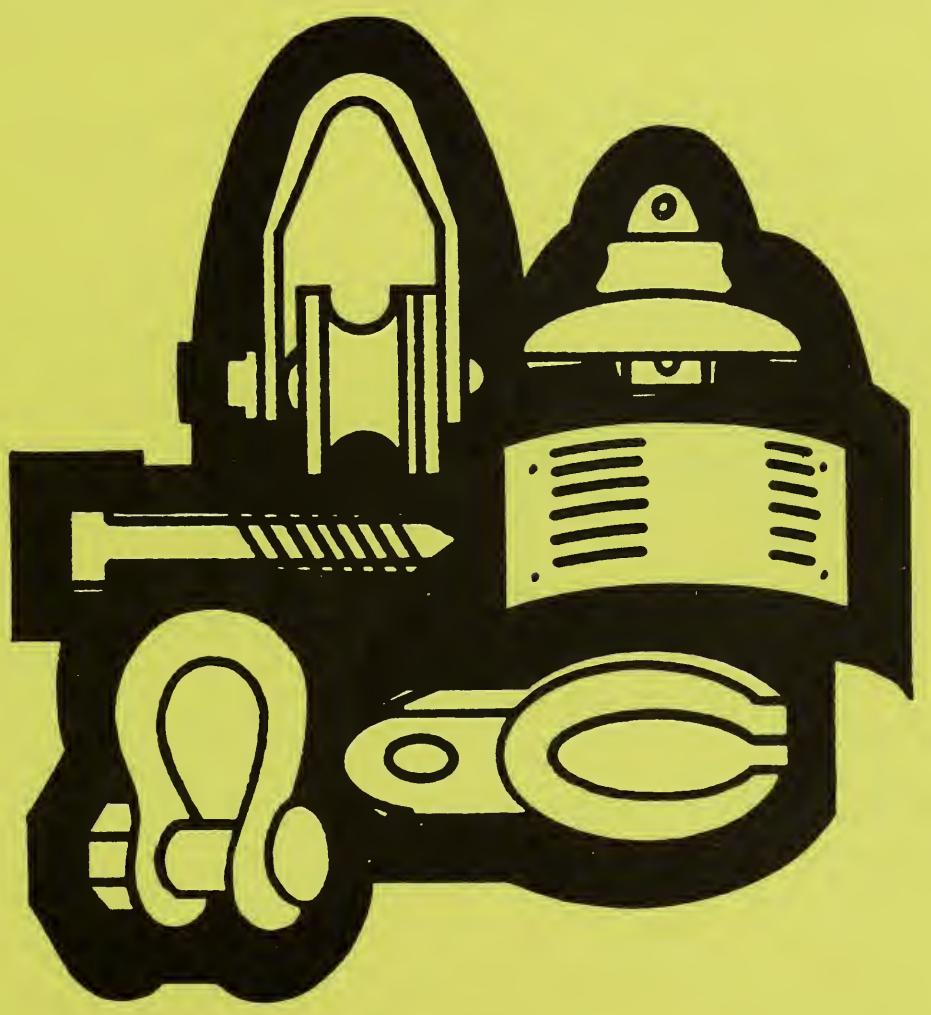
July 1995

List of Materials

Acceptable for Use on Systems of RUS Electrification Borrowers



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July 1995

PREFACE

This list supersedes all preceding issues including revisions. Revised sheets reflecting changes in the list will be issued quarterly and should be inserted in order to keep your copy up to date.

The items shown in this publication include material and equipment for transmission and distribution facilities. Items not listed include office equipment, tools and work equipment, items of electric general plant and consumer owned wiring facilities. The listings apply only to new items of material and equipment and not to used items.

In addition to items accepted on a general basis, this list also includes items accepted on a conditional basis. As one of the conditions in the acceptance of an item on a conditional basis, contractors are required to obtain the borrower's concurrence prior to its use.

The inclusion of an item in this list does not indicate that item's manufacturer or its principals have not been debarred, suspended, proposed for debarment, declared ineligible or voluntarily excluded pursuant to Executive Order 12549, Debarment or Suspension, or any rules or regulations issued thereunder, including 7 CFR Part 3017 ("Debarment Regulations"). Therefore, borrowers must comply with the requirements imposed by the Debarment Regulations before entering into any "covered transaction", as defined by 7 CFR Part 3017, involving any item on this list.

The acceptance of an additional item or the deletion of an existing item is a function of the Technical Standards Committees. Any manufacturer desiring to have a new item placed on the list, or any user believing an existing item should be removed from the list, is invited to submit the matter to the Committees. Any communication calling attention to an error or omission in the list, such as a wrong catalog number, an obsolete item, etc., will be appreciated. All communications should be addressed to Technical Standards Committee "A" (Electric), Rural Utilities Service, Ag Box 1569, U. S. Department of Agriculture, Washington, D. C. 20250-1569.

INDEX - PART I

-A-

-B-

-D-

-E-

-F-

-G-

-O-

-P-

-R-

-S-

-T-

-V-

-W-

-Y-

-Z-

INDEX - PART II

Underground Distribution Equipment

a - Insulator, pin type

ANSI Class	55-2	55-3	55-4
Application	5 kV (used on 2.4 kV and 4.16/2.4 kV systems)	12.5/7.2 kV (used on 12.5/7.2 and 13.2/7.62 kV systems)	15 kV (used on 12.5/7.2 and 13.2/7.62 kV systems where greater insulation is needed)
Flashover, dry (plain)	50 kV	65 kV	70 kV
Flashover, dry (radio-freed)	45 kV	55 kV	65 kV
Flashover, wet (plain)	25 kV	35 kV	40 kV
Flashover, wet (radio-freed)	25 kV	30 kV	35 kV
Leakage distance	5 in.	7 in.	9 in.
Pinhole diameter	1 in.	1 in.	1 in.
Cooper Power Systems	NP8D8[1,2]	NP9D8[1]	NP21D8[1]
Joslyn (Pinco)	-	L63R[1]	L2064R[1]
Porcelain Products (Knox)	253	261-S[1]	366-S[1]
Victor Insulators, Inc.	8	5[1]	6[1]

ANSI Class	56-1[1]	56-3[1]	56-4[1]
Application	24.9/14.4 kV distribution lines	33 - 34.5 kV transmission lines	44 - 46 kV transmission lines
Flashover, dry	95 kV	125kV	140 kV
Flashover, wet	60 kV	80 kV	95 kV
Leakage distance	13 in.	21 in.	27 in.
Pinhole diameter	1-3/8 in. Metal thimble (unless noted)	1-3/8 in. Metal thimble	1-3/8 in. Metal thimble
Cooper Power Systems	NP2T8[3]	-	-
Joslyn (Pinco)	L1123-R	L75-R	-
Porcelain Products (Knox)	1027-S	2045-S	-
Victor Insulators, Inc.	27-R[3]	245-R	255-R

[1]Radio-freed
[2]Available in white as indication of neutral. White insulators are non-radio-freed.
[3]Does not have a metal thimble.

Radio-freed and non-radio-freed insulators made by these manufacturers and in these styles are acceptable.

NOTE: Post insulators (Item ea) may be substituted for the crossarm pin (Item f) and pin insulator (Item a) for both small and large conductor distribution drawings shown in RUS Form 803 at the option of the owner.

Conditional List
a(1)
July 1995

a - Insulators, pin type
(Radio-freed)

Manufacturer	Conditions
*Porcelain Products 1027-ST, 24.9/14.4 kV, ANSI Class 56-1	To obtain experience.

*Does not have metal thimble.

NOTE: Post insulators (Item ea) may be substituted for the crossarm pin (Item f) and pin insulator (Item a) for both small and large conductor distribution drawings shown in RUS Form 803 at the option of the owner.

b - Pin, pole top, steel

DISTRIBUTION

	12.5/7.2 or 13.2/7.62 kV	24.9/14.4 kV
Pin length, inches:	20	20
Thread diameter, inches:	1	1-3/8
Hole spacing, inches:	8	8
RUS Specification:	D-3	DT-3
Chance	2199	2195
Cooper Power Systems	DP19P6	DP19P5
Dixie	D-2172-R	D2195-R
Flagg	F220	F220-1
Joslyn	J740	J720
Kortick	-	K8086
Utilities Service	36606F-REA	36652

Pins listed below have 4-1/2" offset
which eliminates the use of Item cs

Chance	C206-0271
Cooper Power Systems	DP28P1
Joslyn	J25179
Utilities Service	36549

TRANSMISSION

Pin Length, inches:	24
Thread diameter, inches:	1-3/8
Hole spacing, inches:	8
RUS Specification:	DT-3
Chance	2196
Cooper Power Systems	DP19P8
Joslyn	J824
Kortick	K8087
Utilities Service	36653F

NOTE 1. Pole top bracket (Item eb) and post insulator (Item ea) may be substituted for pole top pin (Item b) and pin insulator (Item a) for both small and large conductor distribution drawings shown in RUS Form 803 at the option of the owner.

2. Flared type pins may be mounted with either side against the pole.

Conditional List
b(1)
July 1995

b - Pin, pole-top
(Non-lead threads)

Manufacturer	Conditions
Hughes Brothers 2770-A20-100 (1" threads) 2770-A20-130 (1 3/8" threads)	To obtain experience.

c - Bolt, machine

Applicable Specification: ANSI C135.1, "Standards for Galvanized Steel Bolts and Nuts" except that the lengths are in the ranges given below.

Applicable Sizes:

1/2 inch diameter, 6 through 10 inch length

5/8 inch diameter, 6 through 24 inch length

3/4 inch diameter, 6 through 26 inch length

7/8 inch diameter, 6 through 28 inch length

The following manufacturers have shown compliance with the applicable specifications for machine bolts:

A. B. Chance Company
* Cooper Power Systems
Dixie Electrical Manufacturing Company
Hughes Brothers
* Joslyn Manufacturing Company
Kortick Manufacturing Company
* Portland Bolt & Manufacturing Company
The Rockford Bolt & Steel Company
Steel City Bolt & Screw Co., Inc.
Utilities Service Company

*"Static proof" design available.

d - Washers, Flat

Flat Rolled Steel

Size, inches:	2-1/4 x 2-1/4	3 x 3	4 x 4	4 x 4	1-3/8 round	1-3/4 round
Thickness, in.:	3/16	1/4	3/16	1/2	12 gauge	10 gauge
Hole Diam., in.:	13/16	13/16	13/16	13/16	9/16	11/16
C & C Spacer	4	-	-	-	-	-
Chance	6814	6817	6818	6819-1/2	6803	6805
Cooper	DF2W5	DF2W7	DF2W10	DF2W15	DF1W2	DF1W3
Dixie	D6814	D6817	D6818	D6819-1/2	D6803	-
FWC	FW1076		FW1080		FW1086	FW1088
Hughes	SW2-1/4-70-3/16	SW3-70	SW4-70	SW4-70(1/2)	RW1-3/8-50	-
Joslyn	J1076	J1079	J1080	J1473	J1086	J1088
Kortick	K1553	K1555	K1557	K1559-1/2	K1524	K1525
Line Hardware	SWF-225B	SWF-300B	SWF-400A	-	-	-
Utilities Service	5485	5487A	5488	5490A	5478	5479

Flat Cast

Size, inches:	3 x 3
Thickness, in.:	1/4
Hole Diam., in.:	13/16
Chance (N)	BB214
Flagg (MIF) (N)	P56A

Spurred

3" Round, 3/16" Thick, 13/16" Hole

Continental (N)	TCSF-30-6
Flagg (MIF) (M)	PX159A

(A) Aluminum Alloy
(M) Malleable Iron
(N) Nodular Iron

Washers, Curved

Curved Cast

Size, inches:	2-1/4 x 2-1/4	3 x 3	3 x 4	4 x 4
Thickness, in.:	1/4	5/16	7/16	1/2
Hole Diam., in.:	11/16	11/16	15/16	13/16
American Connector (A)	-	CW 33-5	CW 34-7	CW 44-6
Atlas Power Products (N)	-	-	-	FWC-44-6
Chance (N)	GCW1A	GCW31	CRW4A	GCW41
Continental (N)	-	CW-33-5	CW-34-7	CW-44-6
Flagg (MIF)(M)	P141	P143	P120	P144
Line Hardware (M)	-	CSW-33	CRW-34	CSW-44
Reliable/Bethea (A)	-	WC-33-5	WC-34-7	WC-44-6
Universal Electric (A)	UW-225	UW-335	UW-347	UW-446

(A) Aluminum Alloy
(M) Malleable Iron
(N) Nodular Iron

Curved Rolled Steel

Sizes, inches:	3 x 3	4 x 4(1)
Thickness, in.:	5/16	1/4
Hole Diam., in.:	11/16	15/16
Joslyn (Steel)	J114	J6829

(1) To be used only on transmission systems.

f - Pin, crossarm
(With square washer, nut and MF locknut)

DISTRIBUTION

Thread (inches diam.)	1	1-3/8	1	1-3/8
Length above base (in.)	5	7	5	7
Length below base (in.)	5-3/4	7	1-1/2	1-3/4
Shank (inches diam.)	5/8	5/8	5/8	3/4
	Long Shank		Short Shank	
Chance	881	4717	886	-
Cooper Power Systems	DP2S1*	DP3T1*	DP2S37*	DP5T22*
Dixie	D881	-	-	-
Joslyn	J203*	J647*	J221*	J630*
Kortick	K7104	K7611	K7122	K7631
Utilities Service	558	3137A	579	3142

Clamp Type Pin

Thread (inches diam.)	1	1-3/8
Length above base (in.)	5-3/4	7
Chance	14322	14322-1
Cooper Power Systems	DP2C1	DP2C11
Dixie	D3322	D3324
Joslyn	J3322	J3324

Washer Plate for Clamp Type Pin

These plates are equipped with lugs to prevent slippage of pin along crossarm. They may be used to replace the bottom plate on pins already installed.

Chance	450091
Cooper Power Systems	DP9X1
Joslyn	J3322-P

*"Static proof" designs available.

f - Pin, crossarm
(With square washer, nut and locknut)

TRANSMISSION

Thread (inches diameter)	1-3/8	1-3/8
Length above base (inches)	10	10
Length below base (inches)	7	1-3/4
Shank (inches diameter)	3/4	3/4

	Long Shank	Short Shank
Chance	4332	-
Cooper Power Systems	DP7T9*	DP5T24*
Joslyn	J610*	J633*
Kortick	K7643	K7635
Utilities Service	3140	3145

* "Static proof" designs available.

Conditional List
f(1)
July 1995

f - Pin, crossarm
(Non-lead threads)
(With square washer, nut and MF locknut)

Manufacturer	Conditions
Joslyn	
J203Z, 1" thread, 5-3/4" shank	To obtain experience.
J221Z, 1" thread, 1-1/2" shank	
J647Z, 1-3/8" thread, 7" shank	
J630Z, 1-3/8" thread, 1-3/4" shank	

h - Brace, crossarm, steel

Wherever item “h” is shown on a construction drawing, use a brace from page cu.

i - Bolt, carriage

Applicable Specification: ANSI C135.1, "Standard for Galvanized Steel Bolts and Nuts."

Applicable Sizes: 3/8 inch diameter, 3 through 6 inch length

1/2 inch diameter, 3 through 6 inch length

The following manufacturers have shown compliance with the applicable specifications for carriage bolts.

A. B. Chance Company

Cooper Power Systems

Dixie Electrical Manufacturing Company

Hughes Brothers

Joslyn Manufacturing Company

Kortick Manufacturing Company

The Rockford Bolt & Steel Company

Utilities Service Company

j - Screw, lag

Applicable Specifications: ANSI C135.3 "Standard for Zinc Coated Ferrous Lag Screws"

Applicable Sizes:	1/2 inch diameter, 4 inch length
	1/2 inch diameter, 5 inch length
	5/8 inch diameter, 4 inch length
	5/8 inch diameter, 5 inch length

The following manufacturers have shown compliance with the applicable specifications for lag screws:

A. B. Chance Company
Cooper Power Systems
Dixie Electrical Manufacturing Company
Joslyn Manufacturing and Supply Company
Kortick Manufacturing Company
Utilities Service Company

k - Insulators, suspension

ANSI Class Type	52-9A Clevis	52-1 Clevis	52-4 Clevis	52-3 Ball & Socket
Disc Diameter	4-1/4"	6"	9" or 9-1/2"	9" or 9-1/2"
M & E Rating, lbs.	10,000	10000	15,000	15,000
Leakage	6-3/4"	7"	11-1/2"	11-1/2"
Flashover; kV: Dry	60	60	80	80
Flashover, kV: Wet	30	30	50	50
NOTES	(3) (4)	(3) (4)	(5)	(2)

Manufacturer	Catalog Number			
Joslyn (Pinco)	L1814	L1510	L-970	L-960
Lapp	-	-	9100	9000
Locke	16044	16583	15S410	15S409
Porcelain Prod. (Knox)	84300	86012	-	-
Sediver	CT-4R2-M	-	-	-
Victor Insulators, Inc.	817	804	-	-

Notes: (2) To be used only on transmission lines.
(3) To be used only on distribution lines.
(4) Use two insulators for 12.5/7.2 kV deadends and three for 24.9/14.4 kV deadends.
(5) Use two insulators for 24.9/14.4 kV deadends.

k - Insulators, suspension

ANSI Class Type	52-3 Ball & Socket	52-4 Clevis	52-5 Ball & Socket	52-6 Clevis
Disc Diameter	10"	10"	10"	10"
M & E Rating, lbs.	15,000	15,000	25,000	25,000
Leakage	11-1/2"	11-1/2"	11"	11"
Flashover; kV: Dry	80	80	80	80
Flashover, kV: Wet	50	50	50	50
NOTES	(2)	(1)	(2)	

Manufacturer	Catalog Number			
GEC Alsthom	-	105452	-	-
ICI (Pinco)	L1060	L1070	L1500	L1570
Lapp	8200	8100	301425	2300
Locke	20S840	20S580	30S255	30S257
Porcelain Prod. (Knox)	81022	81012	-	-
Sediver	-	CT-8R2	-	-

Notes: (1) Use two for 24.9/14.4 kV deadends.
(2) To be used only on transmission lines.

k - Insulator, suspension

Manufacturer	Conditions
Sediver 10" suspension insulator N-8R2 (ball & socket, 20,000 lbs.) CT-14R2 (clevis, 30,000 lbs.) N-14R2 (ball & socket, 30,000 lbs.)	To obtain experience.

Conditional List
k(2)
July 1995

k - Insulator, polymer distribution deadend

Manufacturer	Conditions
Chance	
Distribution deadend	1. To obtain experience.
Type "E"	2. For use as deadends on distribution lines only.
Catalog No. C654-3015 (15 kV line-to-line)	3. Not recommended for use in areas subject to contamination.
Catalog No. C654-3025 (25 kV line-to-line)	
Catalog No. C654-3034 (35 kV line-to-line)	
Dulmison	
Distribution deadend	1. Same as (1) above.
H-15 kV-4	2. Same as (2) above.
H-25 kV-6	3. Same as (3) above.
Joslyn	
Distribution deadend	1. Same as (1) above.
UDI 671-3002 (15 kV line-to-line)	2. Same as (2) above.
UDI 671-3010 (25 kV line-to-line)	3. Same as (3) above.
K-Line	
Distribution deadend	1. Same as (1) above.
KL-15SCT	2. Same as (2) above.
KL-28ECT	3. Same as (3) above.
KL-35ECT	
Lapp	
Distribution deadend	1. Same as (1) above.
Catalog No. 151001, 15 kV	2. Same as (2) above.
Catalog No. 151002, 25 kV	3. Same as (3) above.
Ohio Brass	
"Veri*Lite"	1. Same as (1) above.
Type PDI-15 (15 kV)	2. Same as (2) above.
Type PDI-25 (25 kV and 35 kV)	3. Same as (3) above.
Porcelain Products	
Distribution deadend	1. Same as (1) above.
PDEI-15, 15 kV	2. Same as (2) above.
PDEI-25, 25 kV	3. Same as (3) above.
Reliable	
DS-15G (15 kV)	1. Same as (1) above.
DS-25G (25kV)	2. Same as (2) above.
DS-35G (35 kV)	3. Same as (3) above.

NOTE: When insulators from this page are used, adjust construction drawing material list quantities as necessary. Recommended maximum working load is 5,000 lbs.

k - Insulator, polymer distribution deadend

Manufacturer	Conditions
Salisbury Distribution deadend 9501 Series, 15 kV 9502 Series, 25 kV	1. To obtain experience. 2. For use as deadends on distribution lines only. 3. Not recommended for use in areas subject to contamination.
Sediver Distribution deadend ODI-11-70-15 (15 kV) ODI-15-70-28 (25 kV) ODI-17-70-35 (35 kV)	1. Same as (1) above. 2. Same as (2) above. 3. Same as (3) above.

NOTE: When insulators from this page are used, adjust construction drawing material list quantities as necessary. Recommended maximum working load is 5000 lbs.

I - Clamp, deadend

DISTRIBUTION

Copper 2 through 6 CWC 4A through 8A		ACSR (Aluminum Clamps)			
		4/0 & 3/0	2/0	1/0	2&4
-	Alcoa	302	302	302	302
-	American Connector Engineering	QDA-63	QDA-53	QDA-53	QDA-53
80500-2000	Anderson/Sq.D	PG-57N	PG46N	PG-46N	PG-46N
-	Atlas	-	ADQ-53-1-N	ADQ-53-1-N	ADQ-53-1-N
-	Continental	AQD-63	AQD-52	AQD-52	AQD-52
-	C & R	CR-20-90	CR-10-90	CR-10-90	CR-10-90
-	Lapp	306120N	306118N	306118N	306118N
-	Reliable/Bethea	DA-20N	DA-15-N	DA-15-N	DA-15-N

I - Deadend for steel strand (overhead ground wire)

TRANSMISSION

For high strength, extra high strength steel strand and aluminum clad steel strand

	High Strength Steel		Aluminum-clad steel			Extra High Strength		
Manufacturer	3/8"	7/16"	7 No. 9 AWG	7 No. 8 AWG	7 No. 7 AWG	5/16"	3/8"	7/16"
Compression Type								
Alcoa	4620.12	4627.14						
Burndy	YTW375E	YTW438E	YTW7M9T	YTW7M8T	YTW7M7T			
Fargo	861255	861430	861225	861227	861430	861022	861225	861430
Formed Type*								
Chance				16M-AWTLG	20M-AWTLG			
Helical Line Prod.	HG210-3/8	HG211-7/16	HG523-12.5M	HG525-16M	HG528-20M	HG209-5/16	HG210-3/8	HG211-7/16

* Class B galvanizing. When overhead ground wire has Class C galvanizing, formed deadend should also have Class C galvanizing.

Automatic Type								
Fargo	GDE-302	GDE-303	GDE-302	GDE-302	GDE-303	GDE-301	GDE-302	GDE-303
Reliable	5202	5203	5202	5202	5203	5201	5202	5203
Clamp Type								
Anderson/Sq. D	SWDE-55N	SWDE-55N						
Continental	FQD-55-3LW	FQD-55-3-LW						
Reliable/Bethea	FD-550-N							

Conditional List
I(1)
July 1995

I - Clamp, deadend

DISTRIBUTION

2-Bolt Straight Line, Aluminum Alloy*

Manufacturer	Conditions
American Connector Engineering Aluminum alloy deadend Catalog No. SDA 53 (#4-3/0 ACSR)	1. To obtain experience. 2. Applications limited to replacements under hot line conditions.
Anderson/Square D Aluminum alloy deadend Catalog No. ADSO-88(#2-1/0 ACSR) Catalog No. ADS-48-N (2/0 ACSR) Catalog No. ADS-60-N (3/0 ACSR)	Same as above.
Burndy Aluminum alloy deadend Catalog No. CUW26RE-1 (#2-2/0 Str. Aluminum, #4-2/0 ACSR)	Same as above.
C & R Products Catalog No. CRDE-10-180 (#4 - 2/0 ACSR) Catalog No. CRDE-20-180 (3/0 - 4/0 ACSR)	Same as above.
Chance Aluminum alloy deadend Catalog No. SDF10A (4 through 4/0 ACSR)	Same as above.
Continental Aluminum alloy deadend Catalog No. HDSO-57 (with side opening) (4-4/0 ACSR) Catalog No. SGA-52-23 (4-2/0 ACSR) Catalog No. SGA-60 (3/0-4/0 ACSR)	Same as above.
Fargo Aluminum alloy deadend Catalog No. GD-961A side opening keeper (No. 4 and No. 2 ACSR) Catalog No. GD-972A (2/0, 3/0, 4/0 ACSR)	Same as above.

*Straight line deadend clamps are applicable for urban construction where tensions are moderate and on lines often worked hot.

I - Clamp, deadend

DISTRIBUTION

2-Bolt Straight Line, Aluminum Alloy*

Manufacturer	Conditions
Reliable/Bethea Aluminum alloy deadend Catalog No. ASO-684-2 (1/0, 2/0, 3/0 ACSR) Catalog No. ASD-2-N (4-2/0 ACSR) Catalog No. ASD-34-N 3/0, 4/0 ACSR	1. To obtain experience. 2. Applications limited to replacements under hot line conditions.

*Straight line deadend clamps are applicable for urban construction where tensions are moderate and on lines often worked hot.

Conditional List
I(2)
July 1995

I - Clamp, deadend

DISTRIBUTION

(wedge type)

Manufacturer	Conditions
Fargo	
Catalog No. GDW-010 (#4 - 1/0 ACSR)	To obtain experience.
Catalog No. GDW-040 (2/0 - 4/0 ACSR)	
Catalog No. GDW-556 (266.8 - 477 kcmil ACSR)	

m - Clamp, suspension

2 BOLT - DISTRIBUTION

	Copper & CWC	ACSR with Straight or Formed Armor Rods			
		4	2	1/0 & 2/0	3/0 & 4/0
ABB	6240	6241	6242	6243	6244
Alcoa	-	-	-	-	HSU*
American Connector	FLS-53	ALS-62	ALS-62	ALS-86	ALS-105
Anderson/Square D	MS-46-N	MS-60-N	MS-70-N	HAS-85-N	HAS-104-N
C & R Products	-	-	-	CRSC-1	CRSC-2
Chance	FWG1	FWG2	FWG3	FWG4	-
Continental Electric	FSC-46-N	FSC-60-N	SC-70-N	SC-85-N	SC-105-N
Dulmison	-	-	-	-	HSU*
Lapp	305740N	306027N	306028N	306029N	306030N
Preformed	-	-	-	-	AGS*
Reliable/Bethea	FS-46-N	GW-1-N	LS-0-N	LS-1-N	LS-2-N

*Accepted for larger sizes.

m - Clamp, Suspension

ANGLE - DISTRIBUTION No. 2 & 4 ACSR Plus Rods		2-BOLT TRANSMISSION For 3/8" Steel Overhead Ground Wire
2300	ABB	6240
-	American Connector	FLS-53
AAC-301 & 302	Anderson/Square D	MS-46-N
-	Chance	FGW1
AC-75	Continental	FSC-46N
GD-907A	Fargo	-
306092	Lapp	305740N
AC-60	Line Hardware	-
RALS-1	Reliable/Bethea	FS-46-N

n - Bolt, double arming

Applicable Specification: ANSI C135.1, "Standard for Galvanized Steel Bolts and Nuts."

Applicable Sizes : 5/8 inch diameter, 12 inch through 24 inch length

3/4 inch diameter, 20 inch through 24 inch length

The following manufacturers have shown compliance with the applicable specifications for double arming bolts:

A. B. Chance Company
* Cooper Power Systems
Dixie Electrical Manufacturing Company
Hughes Brothers
* Joslyn Manufacturing Company
Kortick Manufacturing Company
Portland Bolt & Manufacturing Company
Steel City Bolt & Screw Co., Inc.
Utilities Service Company

*"Static proof" designs available.

o - Bolt, eye, oval

Applicable Specification: ANSI C135.4, "Standards for Galvanized Ferrous Eye Bolts and Nuts for Overhead Line Construction."

Applicable Sizes : 5/8 inch diameter, 6 through 20 inch length

3/4 inch diameter, 8 through 20 inch length

The following manufacturers have shown compliance with the applicable specifications for oval eye bolts:

Berny's Forging Company
A. B. Chance Company
* Cooper Power Systems
Dixie Electrical Manufacturing Company
* Joslyn Manufacturing Company
Kortick Manufacturing Company
Utilities Service Company

*"Static proof" designs available.

Shoulder Eye Bolt
for Transmission Structures

3/4 inch diameter, 8 inch through 20 inch length

	Catalog Number
Joslyn	J9528 to J9540
Kortick	K9558 to K2570

p - Connectors, distribution (Parallel Groove)

Applicable Specification: ANSI C119.4

ACSR to ACSR
To same size or smaller

Bare Conductor

	4/0 - 2/0	1/0	2	4
Alcoa	-	396.6	490.0	490.0
Anderson/Sq. D	LC-53A	LC-51C	LC-51A	LC-51A
Blackburn	PAE 4141-9	PAE 2121-9	PAE 2121-9	PAE 2121-9
Burndy	KVS28A	UCG25R	UC25R2R	UC25R2R
Connector Mfg.	APC-2/0	APC-2/0	APC-1/0	APC-1/0
Fargo	GA-9040L	GA-9020L	GA-9002L	GA-9003L
Penn-Union	PCAA-20BF	PCAA-15BF	PCAA-10BF	PCAA-10BF
Reliable/Bethea	APG-3	APG-2	APG-1	APG-1

Over Armor Rods

	3/0	2/0	1/0	2	4
Anderson/Sq. D	LC-83A	LC-52C	LC-52C	LC-52C	LC-52C
Blackburn	-	-	PAA10	PAA10	PAA10
Burndy	-	-	UC32R	UC32R	UC32R
Fargo	GA-9843	GA-9842	GA-9041L	GA-9020L	GA-9020L
Penn-Union	-	-	ARC-12	ARC-11	ARC-14
Reliable	-	-	744AL	600AL	600AL

p - Connectors, Distribution (Parallel Groove)

Applicable Specification: ANSI C119.4

ACSR to Copper or Copperweld-Copper

ACSR Size (Bare Conductor)

	3/0	2/0	1/0	2	4
Alcoa	197	R193	R193	195	195
Anderson/Sq. D	LC-811A	LC-811A	LC-522A	LC-511A	LC-511
Blackburn	PAC7	PAC7	PAC345	2CA	4CA
Fargo	GA-9040L	GA-9040L	GA-9020L	GA-9002L	GA-9003L
Reliable	600ALC	555ALC	438ALC	438ALC	438ALC

ACSR Size (Over Armor Rods)

	3/0	2/0	1/0	2	4
Alcoa	201	R197	R197	R197	199
Anderson/Sq. D	LC-833	LC-833	LC-811A	LC-811A	LC-811
Blackburn	-	-	PAC7	PAC7	PAC7
Fargo	GA-9843C	GA-9842C	GA-9040L	GA-9020L	GA-9020L
Reliable	-	-	744ALC	600ALC	600ALC

p - Connector, Distribution

Applicable Specification: ANSI C119.4

Copper Type Conductors
Connections to same size or smaller

Bare Conductor

	Copperweld Copper	2A		4A	6A	8A
	Copper	0x7	2x3		4	6
	Anderson/Sq. D	DG-1/0	DG-1	DG-2	DG-4	DG-6
(s)	Blackburn	1/0H	1H	2H	4H	6H
(s)	Burndy	KS-25	KS-23	KS-23	KS-20	KS-17
(s)	Dossert	DS-10-F	DS-6-F	DS-6-F	DS-3-F	DS-2-F
	Fargo	GC-5020	GC-5002S	GC-5002	GC-5004	GC-5006
(s)	Greaves	-	A-8	-	A-5	A-3
(s)	ILSCO	IK-1/0	IK-2	IK-2	IK-4	IK-6
(s)	Kearney	118109	118109	118108	118104	118102
(s)	Krueger & Hudepohl	UC58C-EV	-	-	-	-
(s)	Penn-Union	S1/0	S2	S3	S4	S6
(s)	Reliable	-	1F	2F	4F	6F
	Royal Switchgear	1739	1739	-	-	-

Over Armor Rods

	Anderson/Sq. D	K-5	K-4	K-4	K-2	K-2
	Burndy	KVS-31	KVS-31	KVS-28	KVS-26	KVS-26
	Fargo	GC-5035	GC-5035	GC-5040	GC-5020S	GC-5020
	ILSCO	IKB-350	IKB-350	IKB-4/0	-	-
(s)	Kearney	118112	118112	118111	118110	118110
	Penn-Union	VT-4	VT-3	VT-3	VT-2	VT-1

(s)designates split bolt connectors

Long Connectors (Split Bolt)
Copper to Copper

	2	4	6
Anderson/Sq. D	C-2-L	C-4-L	C-6-L
Blackburn	2H3	4H3	6H3
Burndy	KS-22-3	KS-20-3	KS-17-3
Dossert	DS5-3	DS3-3	DS2-3
Greaves	A-9	A-6	A-4
Kearney	118107	118105	118103
Penn-Union	SEL-2	SEL-4	SEL-6
Reliable	-	4F	6F

p - Connectors, Service (Parallel Groove)

Applicable Specification: ANSI C119.4
Aluminum-to-Aluminum
Solid or Stranded

	No. 2	No. 4
Alcoa	490.0	490.0
Anderson/Sq. D	LC-51A	LC-51A
Blackburn	PAE 2121-9	PAE 2121-9
Burndy	UC25R2R	UC25R2R
Fargo	GA-9002L	GA-9002L
Penn-Union	PCAA-10BF	PCAA-10BF
Reliable/Bethea	APG-1	APG-1

p - Connectors, Service (Parallel Groove)

Applicable Specification: ANSI C119.4
Aluminum-to-Copper
Solid or Stranded

	2 Al to 4 Cu	4 Al to 6 Cu
Anderson/Sq. D	LC-511A	LC-511A
Blackburn	PAC345	PAC345
Fargo	GA-9002L	GA-9002L

p - Connectors, Service

Applicable Specification: ANSI C119.4
Copper-to-Copper
Solid or Stranded

Manufacturer	No. 4	No. 6
Anderson/Sq. D	4E	6ES
Blackburn	4N	6N
Burndy	KP4C	KP6C
Dossert	ES-4	ES-6
Fargo	GC-5004	GC-5006
Ilsco	SX-4	SX-6
Penn-Union	SX-4	SX-6
Southport	SE-3	SE-2

p - Connectors, Guy Bond (Parallel Groove)

Applicable Specification: ANSI C119.4

ACSR to Guy Strand

	2/0	1/0	2 & 4
Alcoa	396.6	396.6	490.0
Anderson/Sq. D	LC-52A-GP	LC-51C-GP	LC-51A-GP
Blackburn	PAE 2121-9	PAE 2121-9	PAE 2121-9
Burndy	UC 28R	UCG25R	UCG25R
Dossert	AC103-LW	AC101-LW	AC100-LW
Fargo	GA-9040L	GA-9040L	GA-9040L
Penn-Union	ALC-15	ALC-10	PCA-010
Reliable	744AL	555AL	438AL

Copper to Guy Strand

AMP	C-LOK Series
Anderson/Sq. D	LC-511A
Blackburn	K-1
	2HPW (1/4")
	1/0 HPW (3/8")
Burndy	UC8W26L
C & R	CRJC-1
Dossert	UDV 13-1-P
Fargo	GC-8040P
ILSCO	SK-3 (1/4")
	SK-1/0 (3/8")
Joslyn	J8300
Kearney	9968-1
Krueger & Hudepohl	UC58B-EV
Penn-Union	JC-1-AC
	(1/4", 3/8" guy strand)
	(1/0 strand copper max.)
Reliable	438ALC

p - Connectors, Compression
Applicable Specification: ANSI C119.4

DISTRIBUTION

	Aluminum to aluminum	Aluminum to copper	Copper to copper	Tap Connections (Al to Al,Al to Cu)
Anderson/Sq. D	AC Series	AC Series	VCUC	VCP
Blackburn	Type WR	Type WR	Type CF	Type WR
Burndy	"Hycrimp" (Type YH)	"Hycrimp" (Type YH)	Crimpit" (Type YC-C)	"Cabelok Crimpit" (Type YP-U)
Homac	H Tap-OB&DB	H Tap-OB&DB	CC	H Tap-OB&DB
Kearney	"Squeezeon" (Aluminum)	"Squeezeon" (Aluminum)	"Squeezeon" (Copper)	"Squeezeon" (Aluminum)
Penn-Union	"Press-On" (Aluminum)	"Press-On" (Aluminum)	"Press-On" (Copper)	"Penn-L-Tap"

NOTE: These connectors are acceptable when installed using tools and dies in accordance with the connector manufacturer's recommendations.

p - Connectors, Compression
Applicable Specification: ANSI C119.4

SERVICE

	Aluminum-to-Aluminum Aluminum-to-Copper	Copper-to-Copper
Anderson/Sq. D	VAUS	VHS
Blackburn	CS, KL ICS-1, IKL (Insulated)	-
Burndy	"Linkits" (Type YSU, YSD) "Insulink"(ES)	"Hysplice" (Types YDS-C, YDS-W)
Homac	"Shure Splicers"	-
Kearney	"Serv-ens"	-
National Tel. Supply	"Nicopress"	-
Penn-Union	"Penn Sleeves"	-

These connectors are furnished in a variety of sizes to fit all combinations of aluminum and copper service wire.

NOTE: These connectors are acceptable when installed using tools and dies in accordance with the connector manufacturer's recommendations.

p - Connectors, Transmission
Applicable Specification: ANSI C119.4

BOLTED TYPE

ACSR to ACSR
ACSR to Copper

Alcoa	580 Series
Burndy (ACSR to ACSR)	UP-A, UP-R

When ordering these clamps specify size, stranding and material of both conductors.

COMPRESSION TYPE

ACSR to ACSR
Same Size

Conductor Size	Alcoa	Anderson	Blackburn	Burndy	Kearney
1/0	5074.438	VPUS	RCJ10	YCS25R	OHR-1/0-61AJ
2/0	5074.484	-	RCJ20	YCS26R	OHR-2/0-61AJ
3/0	5075.547	Order	RCJ30	YCS27R	OHR-3/0-61AJ
4/0	5075.609	by	RCJ40	YCS28R	OHR-4/0-61AJ
266.8 kcmil	5076 Order by	Conductor	RCJ266M	YCS30R	HR-266-267AJ
336.4 kcmil	5076 stranding	Size	RCJ336M	YCS33R	HR-336-267AJ

ACSR to Copper

Alcoa	5070 Series
Anderson/Sq. D	VPUS
Burndy	YCR-R-CA

(Order by conductor sizes)

NOTE: These connectors are acceptable when installed using tools and dies in accordance with the connector manufacturer's recommendations.

p - Connectors

(wedge type)

Manufacturer	Aluminum-to-aluminum	Aluminum-to-copper	Copper-to-copper	Tap Connections (Al to Al ,Al to Cu)
AMP	AMPACT MINIWEDGE	AMPACT MINIWEDGE	AMPACT C-LOK Series	AMPACT MINIWEDGE
Burndy	WEJTAP	WEJTAP	WEJTAP	WEJTAP
Connector Products, Inc.	Aluminum Tap Connector	Aluminum Tap Connector	-	Aluminum Tap Connector

p - Connectors

Manufacturer	Conditions
Anderson/Square D	
*Compression al to al al to cu "Versa-Crimp" L tap.	To obtain experience.
Parallel groove, aluminum LC-52C (1/0 - 6/1 ACSR over armor rods) LC-51C (1/0 - 6/1 ACSR)	To obtain experience.
Blackburn	
Bolted, insulated IPC 1102 (#2-1/0 run, #2 tap) IPC 4111 (1/0-4/0 run, #2-1/0 tap) IPC 4141 (1/0-4/0 run, 1/0-4/0 tap)	1. For use on 600 volt maximum insulated conductors. 2. To be used only for connecting service drop conductors to service entrance conductors. 3. To obtain experience.
Homac	
*Compression, Insulated "Shure Splicers" Types Q1N and U1N	To obtain experience.
Kupler	
Bolted, insulated 130001 (#2-1/0 run, #2 tap) 130003 (1/0-4/0 run, #2-1/0 tap) 130004 (1/0-4/0 run, 1/0-4/0 tap)	1. For use on 600 volt maximum insulated conductors. 2. To be used only for connecting service drop conductors to service entrance conductors. 3. To obtain experience.
Penn Union	
*Compression, Insulated Type PIK	To obtain experience.
Utilco	
Two bolt style, al to al Type PM	To obtain experience.

*NOTE: These connectors are acceptable when installed with tools and dies in accordance with the connector manufacturer's recommendations.

q - Bolt, double upset

Applicable Specification: "RUS Specifications for Single and Double Upset Spool Bolts," D-5

Diameter, inches Length, inches	5/8 7	5/8 8	5/8 9	5/8 10
Chance	-	7826	7828	7830
Cooper Power Systems*	-	DC3E11	DC3E12	DC3E13
Dixie	D7824	D7826	D7828	D7830
Joslyn	-	J2394	J2395	J2396
Kortick	K4760	K4761	K4762	K4763
Utilities Service	31065	31067	31069	31071

*Static proof' designs available.

s - Clevis, secondary swinging

Applicable Specifications: "RUS Specifications for Secondary Swinging Clevises," D-6

Manufacturer	Clevis only*	Clevis with 1-3/4" groove spool	Clevis with 3" groove spool
Chance	0352	0352-C909-1032	0352-C909-1034
Cooper	DC4S1	DC4S14	DC4S13
Dixie	D0352	-	-
Joslyn	J0322	J0392	J0393
Kortick	K9259	K9109	K9149
Utilities Service	32043	36043	32143

*Catalog Number does not include spool. See page cm for spool type insulators.

u - Deadend for galvanized steel or alumoweld guy strand

3-Bolt Guy Clamp

	Light (1/2" bolts)	Heavy (5/8" bolts)*
Chance	6450	6461
Cooper Power Systems	DG3C2	DG3C3
Dixie	D6450	D6461
Joslyn	J930	J931
Kortick	K4124	K4005
Utilities Service	5273	5275

U-Bolt Guy Clamp

	Light (3/8" bolts)	Heavy (1/2" bolts)
Chance	GCU38C	-
Continental	GC-64C	GC-67C
Flagg (MIF)	PAX-64C	PAX-67C

Offset Guy Clamp

	Light (1/2" bolts)	Heavy (5/8" bolts)
Chance	6409	6410
Joslyn	J926	J927

*For use on transmission.

u - Deadend for galvanized steel guy strand

Strand Size:	1/4"	9/32"	5/16"	3/8"	7/16"
		Automatic			
Fargo					
Bail for thimble eye	GDE-700	GDE-701	GDE-701	GDE-702	GDE-703
Reliable					
Bail for thimble eye	5100	5201	5201	5102	5103
Bail for guy insulator	5150	5251	5251	5152	5153
		Formed Type			
Alcoa					
For standard guy*	SGG-610	SGG-710	SGG-0790	SGG-0915	SGG-11-5
Carolina Formed Wire					
For standard guy*	50-0250	-	50-0312	50-0375	50-437
Chance					
For standard guy*	1/4 CTLG	9/32 CTLG	5/16 CTLG	3/8 CTLG	7/16 CTLG
For wrapped guy	1/4 GSC-C	9/32 CTLG-C	5/16 GSC-C	3/8 GSC-C	7/16 GSC-C
Dulmison					
For standard guy*	SGG-0610	SGG-710	SGG-0790	SGG-0915	SGG-1105
Florida Wire & Cable					
For standard guy*	FLA 1300	FLA 1400	FLA 1500	FLA 1600	FLA 1700
Helical Line Products					
For standard guy*	HG-207-1/4"	HG-208-9/32"	HG-209-5/16"	HG-210-3/8"	HG-211-7/16"
Preformed Line Products					
For standard guy*	GDE-1104	GDE-1105	GDE-1106	GDE-1107	GDE-1108
For wrapped guy	WGL-2100	WGL-2101	WGL-2102	WGL-2103	WGL-2104

*Class B galvanizing. When guy wire has Class C galvanizing, formed deadend should also have Class C galvanizing.

u - Deadend for aluminum clad guy strand

Strand Size	3#10 (4M)	7#12 (6M)	7#11 (8M)	7#10 (10M)	7X.110" (11.5M)	7#9 (12.5M)	7X.121" (14M)	7#8 (16M)	7X.148" (20M)
				Formed Type Aluminum-Clad Guy Strand					
Carolina Formed Wire For standard guy				51-0301					
Chance For standard guy		6M-AWTLG	8M-AWTLG	10M-AWTLG		12.5M-AWTLG			
Dulmison For standard guy	AWGG 0555	AWGG 0600	AWGG 0685	AWGG 0770	AWGG 0825	AWGG 0870	AWGG 0905	AWGG 0965	AWGG1125
Helical Line Products For standard guy		HG517-6M	HG519-8M	HG521-10M		HG523-12.5M	HG524-14M	HG525-16M	HG528-20M
Preformed Line Products For standard guy	AWDE-4108	AWDE-4110	AWDE-4113	AWDE-4116	AWDE-4118	AWDE-4119	AWDE-4120	AWDE-4122	AWDE-4126
For wrapped guy		WGL-4110	WGL-4113	WGL-4116		WGL-4120			
				Automatic Aluminum-Clad Guy Strand					
Fargo		GDE-300	GDE-301	GDE-301		GDE-302			
Reliable		5200	5201	5201		5202			

v - Guy Attachment
for 5/8" bolt

Type:	Formed Strap	Angle Bolt Eye	Guy Hook	Guy Hook*
Maximum Working Load Rating	23,130 N (5200 lbs.)	23,130 N (5200 lbs.)	23,130 N (5200 lbs.)	37,800 N (8500 lbs.)
Anderson Elec./ Square D	-	-	-	-
Chance	5004	0100	-	GH5
Continental Electric	-	-	GAD	GAD-56-4
Cooper Power Systems	DG6H1	DG11E1	DG21H1 DG21H2	-
Dixie	D5004	D0100	DD-9460	DD-9462
Flagg (MIF)	-	-	P151A	P151X
Joslyn	J25164	J6500	J6555 J6556	-
Kortick	K4035 K4047	K3140	-	-
Line Hardware	-	-	-	HGA-58C
Reliable/Bethea	-	-	-	AG-5
Universal Electric	-	-	-	UGA-56C
Utilities Service	31030	5531	-	-

*This hook may be used in place of the wrapped guy arrangement in assemblies E3-2 and E3-3.

Pole Eye Plates
(5/8" Bolt)

Type	Pole Eye Plate
Maximum Working Load Rating	37,800 N. (8500 lbs.)
Anderson Elec./ Square D	GSP-05
Atlas Power Products	APF-2025
Continental Electric	PEP-66-45
Flagg (MIF)	PX88
Line Hardware	PGA-548
Reliable/Bethea	PE5-6A
Utilities Service	PE21

Conditional List
v(1)
July 1995

v - Guy attachment

Manufacturer	Conditions
Chance Pole Band, with cone head bolt 6280, and guy clip 456 6276 (for 6" to 10" pole) 6277 (for 8" to 14" pole)	To obtain experience. For distribution lines only and 10,000 lbs maximum loading.
Continental Pole Band, UCB-15E	To obtain experience. For distribution lines only and 10,000 lbs maximum loading.
Joslyn Pole Band, with cone head bolt J-6281, and guy clip J-6275 J-6280 (for 6" to 10" pole) J-6270 (for 8" to 14" pole)	To obtain experience. For distribution lines only and 10,000 lbs maximum loading.

w - Insulators, guy strain
(Fiber Reinforced Plastic)

Ult. Strength, lbs.	11,000	15,000	21,000
Atlas Power Products	100 Series	100 Series	200 Series
Chance	-	GS-16	GS-21
Continental	G-11 Series	G-15 Series	G-21 Series
Dulmison	HSI1-1P Series	HSI-2X Series	HSI3-2P Series
Flagg (MIF)	150 Series	150 Series	210 Series
Hughes Brothers	-	692 Series	694 Series
K-Line	-	-	KL Series
Reliable/Bethea	FGS16 Series	FGS16 Series	FGS21 Series

x - Rod, anchor

Applicable Specification: ANSI C135.2, "Standards for Galvanized Ferrous Strand Eye Anchor Rods."

Applicable Sizes:

Single guy: 5/8 inch diam. 6, 7 and 8 feet long
3/4 inch diam. 8, 9 and 10 feet long
1 inch diam. 9 and 10 feet long

Double guy: 5/8 inch diam. 7 and 8 feet long
3/4 inch diam. 8, 9 and 10 feet long
1 inch diam. 9 and 10 feet long

Single Guy Drive: 5/8 inch diam. 7 and 8 feet long
3/4 inch diam. 8, 9 and 10 feet long
1 inch diam. 9 and 10 feet long

Double Guy Drive: 5/8 inch diam. 7 and 8 feet long
3/4 inch diam. 8, 9 and 10 feet long
1 inch diam. 9 and 10 feet long

The following manufacturers have shown compliance with the applicable specifications. Some manufacturers cannot supply all sizes listed above. Check with manufacturer or distributor for availability.

Chance
Cooper Power Systems
Dixie
Eritech (Carolina Galvanizing/Knight)
Grip-Tite
Joslyn
Kortick
Utilities Service

x - Rod, anchor

Applicable Specification: ANSI C135.2 "Standards for Galvanized Ferrous Strand Eye Anchor Rods" except rods are copper covered. Copper coating thickness is 13 mil minimum at any point and a 15 mil average. All purchases should specify that a factory certification to the thickness of the copper must accompany the shipment of the rods.

Applicable Sizes: Double Guy - 3/4 inch diameter, 8 and 9 feet long.

Manufacturer	Conditions
Joslyn	1. To obtain experience. 2. For transmission purposes only. 3. For use with log anchors or copper covered plate anchors only. 4. To be used with copper coated hardware or bronze hardware underground.

y - Galvanized Steel Strand

Usage: Guy, Distribution or Transmission Line
Overhead Static Wire

ASTM Specification: A 475 - For Guy Strand
A 363 - For Overhead Static Wire

Following grades/diameters of steel wire strands are preferred sizes:

For Guying

Siemens-Martin	High Strength	Extra High Strength Grade	
Distribution Line	Dist. or Trans.	Distribution	Transmission
1/4" dia.	1/4" dia.	1/4" dia.	1/4" dia.
3/8"	9/32"	9/32"	9/32"
7/16"	5/16"	5/16"	5/16"
	3/8"	3/8"	3/8"
	7/16"		7/16"

For Overhead Static Wire (Groundwire)

High Strength	Extra High Strength Grade
3/8" dia.	5/16" dia.
7/16"	3/8"
	7/16"

Alcan Cable
Armco Steel Corporation
Bekaert Steel Wire Corporation
Bethlehem Steel Wire
Cal-Wire
Davis-Walker
Florida Wire and Cable
Indiana Steel and Wire
National Strand Products
Paulsen Wire and Rope Corporation
Seal Wire Company
Southwire

Note: The buyer should specify Class A, B, or C coating per ASTM A363 or A475.

y - Steel Strand

Aluminum-Clad
Specifications: ASTM B415 and B416

<u>For overhead groundwire</u>
(Joint and splice requirements for wire and strand to meet ASTM A363)
AWG Sizes: (a) 7 No. 10, (c) 7 No. 9, (d) 7 No. 8, (e) 7 No. 7 AWG

Nehring - Conex	(a), (c), (d), (e)
United States Alumoweld	(a), (c), (d), (e)

<u>For guy strand</u>
(M is rated breaking load in thousand lbs)
M Sizes: 6M (7 No. 12), 8M (7 No. 11), 10M (7 NO. 10), 11.5M (7 x .110"), 12.5M (7 No. 9), 14M (7 x .121"), 16M (7 No. 8), 18M (7 x .139"), 20M (7 x .148")

Alumoclad de Mexico, S.A. de C.V.	8M, 10M, 16M
Nehring - Conex	8M, 10M, 12.5M, 16M, 18M
United States Alumoweld	6M, 8M, 10M, 12.5M, 14M, 20M

Conditional List
y(1)
July 1995

y - Al-Zn Alloy Coated Steel Wire
Applicable Specification: ASTM A785 (Classes 30 & 45)
Condition of Acceptance - To obtain experience

Distribution Guy Strand

Grade	Siemens Martin			High Strength					Extra High Strength				
Size	1/4"	3/8"	7/16"	1/4"	9/32"	5/16"	3/8"	7/16"	1/4"	9/32"	5/16"	3/8"	7/16"
Bethlehem Steel	X	X	X	X		X	X	X	X		X	X	

Transmission Guy Strand

Grade	High Strength					Extra High Strength				
Size	1/4"	9/32"	5/16"	3/8"	7/16"	1/4"	9/32"	5/16"	3/8"	7/16"
Bethlehem Steel	X			X	X	X		X	X	X

(Purchaser should specify class 30 or class 45)

y - Aluminum Coated Steel Wire
Applicable Specification ASTM A474

National Strand Products, 3/8"

Distribution Guy Strand Siemens-Martin High Strength Extra High Strength	To obtain experience.
Transmission Guy Strand High Strength Extra High Strength	To obtain experience.
Overhead Static Wire High Strength Extra High Strength	1. To obtain experience. 2. Must meet the joint requirements of ASTM A363.

y - Zinc - 5% Aluminum - Mischmetal alloy (Zn-5Al-MM) - Coated
Steel Wire Strands
Applicable Specification ASTM A855

Indiana Steel & Wire Co.

Type/Grade:	Nominal diameter (7-wire strand), in.
(S-M):	1/4", 3/8", & 7/16".
(HS):	1/4", 9/32", 5/16", 3/8", & 7/16".
(EHS):	1/4", 9/32", 5/16", 3/8", & 7/16".

	Conditions
Distribution Guy Strand Siemens-Martin (S-M) High Strength (HS) Extra High Strength (EHS)	To obtain experience.
Transmission Guy Strand High Strength (HS) Extra High Strength (EHS)	To obtain experience.
Overhead Static Wire High Strength (HS) Extra High Strength (EHS)	1. To obtain experience. 2. Must meet the joint requirements of ASTM A363.

NOTE: The buyer should specify Class A, B, or C coating.

z - Anchors, Expanding and Plate

DISTRIBUTION

Designated Maximum holding power-lbs.		6,000	8,000	10,000	12,000
Min. Area (sq. in.)		90	100	120	135
Rod Dia. (inches)		5/8	5/8	3/4	3/4
Rod Length (feet)		7	7	8	-
	Type				
Chance	8 way	88135	88135	88135	88135
Cooper	4 way	DA1E5	DA1E6	DA1E6	DA1E7
Dixie	4 way	D88100-G	D88115-G	D88135-G	D88135-G
	Plate	-	D7502-G	-	D7504-G
Everstick	3 way	834	836	8310	-
	4 way	-	-	84-3/4	-
Grip-Tite	8 way	A322812G	A322812G	A322812G	A322812G
Joslyn	8 way	J8100	J8115	J8135	J8135
	Plate	-	J7502	J7503	J7504
Line Hardware	8 way	8-100G	8-115G	8-135G	8-135G
South Central	8 way	-	84115AG	84135AG	84135AG
Utilities Service	8 way	C88100-G	C88115-G	C88135-G	C88135-G
	Plate	-	C617-G	C622-G	C822-G

NOTE: Where galvanized anchors are listed, the same anchors ungalvanized (black asphalt coated) are also acceptable.

z - Anchors, plate

Applicable Specification: "RUS Specification for Steel Plate Anchors," T-3

TRANSMISSION

Minimum Area 400 sq. in.

	3/4" Galv. Rods
Chance	X24 - 3/4
Cooper Power Systems	DA4P7 - 3/4 - G
Grip-Tite	XP24 - 3/4 - G
Joslyn	J3524 - 3/4 - G
Line Hardware	CP-24G

NOTE: Where galvanized anchors are listed, the same anchors ungalvanized (black asphalt coated) are also acceptable.

z - Anchors, Service

Designated Maximum Holding Power in Sand - 2500 lbs.

	Screw	Expanding
Chance	6346	6870
Cooper Power Systems	DA2N1	-
Dixie	D-6526	-
Eritech (Carolina Galvanizing)	86346606	-
Grip-Tite	-	322065G
Joslyn	J6526W-CA	JO870
Line Hardware	-	8-70G
Utilities Service	C6346-G	PL62-2.5-G

z - Anchors, Swamp

DISTRIBUTION

	10" dia.	12" dia.	15" dia.
Chance	10150AS	132AS	152AS
Dixie	D-6710-S	D-6713-S	D-6715-S
Foresight	-	MR-SR*	-
Joslyn	J2871SG		J2872SG
Utilities Service	C10150A-G	C122A-G	C152A-G

*Drive type anchor. Surface area meets or exceeds that of 12" diameter anchors.

NOTE: Where galvanized anchors are listed, the same anchors ungalvanized (black asphalt coated) are also acceptable.

z - Anchors, Rock

	Expanding Rock Anchors			Rock Guy Bolt
Anchor Size - inches	1-3/4	1-3/4	1-3/4	1-3/4
Rod Length - inches	15	30	53	18
Rod Diameter - inches	3/4	3/4	3/4	1
Chance	R315	R330	R353	-
Joslyn	J3436	J3437	J3438	-
Kortick	K5503	K5504	K5505	K2377
Utilities Service	CR315	CR330	CR353	5003

z - Pole keys

Chance	P-4817
Joslyn	J-4817
Utilities Service	CP-4817

z - Anchors, Power-installed screw

Manufacturer: A. B. Chance Company
"SS" Multi Helix Anchors

Working Load Categories

Soil Type	35,600 N (8,000 lb.)	53,400 N (12,000 lb.)	71,000 N (16,000 lb.)	89,000 N (20,000 lb.)
A1 Soil Class 2	12642-AE 12642-AEJ 12642-EJN	12642-AE 12642-AEJ 12642-EJN	12642-AEJ 12642-EJN 12642-EJNS	12642-AEJ 12642-EJN 12642-ENJNS
A2 Soil Class 3	12642-AE 12642-AEJ 12642-EJN	12642-AE 12642-AEJ 12642-EJN	12642-AEJ 12642-EJN 12642-EJNS	12642-EJN 12642-EJNS
B Soil Classes 4 & 5	12642-AE 12642-AEJ 12642-EJN	12642-AEJ 12642-EJN	12642-AEJ 12642-EJN 12642-EJNS	12642-EJNS
C Soil Classes 6 & 7	12642-AEJ 12642-EJN	12642-EJN	12642-EJNS	

Manufacturer: Joslyn
"PS" Screw Anchors

Working Load Categories

Soil Type	35,600 N (8,000 lb.)	53,400 N (12,000 lb.)	71,000 N (16,000 lb.)	89,000 N (20,000 lb.)
A1 Soil Class 2	J23380ACA J23381ACA J23383ACA	J23380ACA J23381ACA J23383ACA		
A2 Soil Class 3	J23380ACA J23381ACA J23383ACA	J23380ACA J23381ACA J23383ACA	J23381ACA J23383ACA J29726ACA	J23383ACA J29726ACA
B Soil Classes 4 & 5	J23380ACA J23381ACA J23383ACA	J23380ACA J23383ACA	J23381ACA J23383ACA J29726ACA	J29726ACA
C Soil Classes 6 & 7	J23381ACA J23383ACA	J23383ACA	J29726ACA	

NOTES:

1. See RUS Specification T-10 for definitions and explanations.

2. Anchors in the 53,400 N (12,000 lb.) category or above for use on wood poles must be used with hardware commensurate with the working load. Hardware may provide for either single or multiple guy attachments to the anchor.

3. Anchors listed in a specific working load category and/or soil class may generally be used at lower working load categories and/or lower numerical soil classes.

z - Anchors, Power-installed screw

Manufacturer: Dixie Electrical Manufacturing Company
Multi-Helix Screw Anchors

Working Load Categories

Soil Type	35,600 N (8,000 lb.)	53,400 N (12,000 lb.)	71,000 N (16,000 lb	89,000 N 20,000 lb.)
A1 Soil Class 2	D-6632 D-6636 D-6637	D-6632 D-6636 D-6637	D-6636 D-6637 D-6638	D-6636 D-6637 D-6638
A2 Soil Class 3	D-6632 D-6636 D-6637	D-6632 D-6636 D-6637	D-6636 D-6637 D-6638	D-6637 D-6638
B Soil Classes 4 & 5	D-6632 D-6636 D-6637	D-6636 D-6637 D-6638	D-6636 D-6637	D-6638
C Soil Classes 6 & 7	D-6636 D-6637	D-6637	D-6638	

NOTES:

1. See RUS Specification T-10 for definitions and explanations.
2. Anchors in the 53,400 N (12,000 lb.) category or above for use on wood poles must be used with hardware commensurate with the working load. Hardware may provide for either single or multiple guy attachments to the anchor.
3. Anchors listed in a specific working load category and/or soil class may generally be used at lower working load categories and/or lower numerical soil classes.

Conditional List
z(1)
July 1995

z - Anchors

Manufacturer	Conditions
Chance Screw anchors, power installed 024462 (6,000 and 8,000 lb.) 12332P (5/8" rod) 12587 (5/8" thimbleye nut) 024484 (10,000 and 12,000 lb.) 12632P (3/4" rod) 6512 (3/4" thimbleye nut)	To obtain experience.
Cooper Power Systems Screw anchors, power installed DA11G621 (6,000 & 8,000 lb., 5/8" rod)	To obtain experience.
Dixie Screw anchors, power installed D-1162-G (6,000 & 8,000 lb., 5/8" rod) D-1375-G (10,000 & 12,000 lb., 3/4" rod)	To obtain experience.
Foresight MR-1, MR-2, MR-3, MR-4	1. To obtain experience. 2. Each installation must be proof tested. Maximum rating is test value achieved.
Joslyn Screw anchors, power- installed J1IB-CA (6,000 & 8,000 lb., 5/8" rod) J13C-CA (10,000 & 12,000 lb., 3/4" rod)	To obtain experience.

NOTES: Where galvanized anchors are listed, the same anchors ungalvanized (black asphalt coated) are also acceptable.

Catalog numbers shown for screw anchors are for anchors with 1-3/8" hubs. Equivalent anchors with 1-1/2" hubs are also acceptable. (A special installing wrench is required.)

aa - Nut, eye
ab - Nut, thimble eye

	aa			ab
	Eye Nut Conventional		Eye Nut Eyelet	Thimble Eye Nut
	5/8"	3/4"	5/8"	5/8"
American Connector Engineering	EN-5	-	-	-
Atlas Power Products	APP-1567-EN	-	APP-1573-BE	APP-1575-TE
Berny's Forging Co.	OE1	-	-	-
Chance	6502	-	B14A	6510
Continental Electric	EN-5	-	BE-5	TN-5
Cooper Power Systems	DG2E3	-	DG6E1	DG1E1
Dixie	D6502	-	DD-6517	D6510
Flagg (MIF)	P125C	-	P127A	P128A
Hughes	EN60	-	-	-
Joslyn	J1092	J1093	J1126	J6510
Kortick	K4212	-	K4413	K3111
Line Hardware	OEN-58	-	BEL-58	-
Reliable/Bethea	E-5	-	B-5	NT-5
Utilities Service	450	-	497	C580

ac - Brace, sidearm diagonal

	1-1/2 inch angle 3/16" x 5'	1-3/4 inch angle 3/16" x 7'
Chance	-	6984
Cooper Power Systems	DB1A1	DB1A5
Joslyn	J1521	J1525
Kortick	K1951	K1954
Utilities Service	5210	5212

ae - Surge (lightning) Arrester, Distribution Class

Manufacturer	Type	Ratings, kV	Duty
ABB	LV	9/10	Normal
	LVBB	9/10, 18	Heavy
Cooper Power Systems	AZL VariSTAR(MOV Type)	9, 10, 18, 27	Heavy
General Electric	Alugard	9, 10, 18	Heavy
Joslyn	Q	9/10, 18	Normal
	J	9/10, 18	Heavy
Kearney	Unigap	9, 10, 18	Heavy

NOTES:

1. Either arresters with external top gaps and without ground lead disconnectors or direct connected arresters with ground lead disconnectors may be used as specified by the user.

2. All above arresters have porcelain housing.

3. All above arresters are SiC type unless otherwise noted.

ae - Surge (Lightning) Arresters, Substation*

Manufacturer	Type	Accepted Ratings - kV	Manufacturer's Classification
ABB	LV	3-20	Distribution
	IVL	3-120	Intermediate
	CPL	3-312	Station
General Electric	Alugard	3, 9, 10, 18	Distribution
Joslyn	Q	3, 9/10, 18	Distribution
Kearney	Unigap	3, 9, 10, 18	Distribution
Ohio Brass	DynaVar (Metal Oxide)		
	VLA	3-27	Station
	VL	3-48	Station
	VN	54-312	Station
	VIA	3-27	Intermediate
	VI	3-120	Intermediate

NOTE: All arresters listed above are SiC type unless otherwise noted.

NOTE: All arresters listed above have porcelain housing unless otherwise noted.

*For instructions concerning application at substations, refer to RUS Bulletin 65-1, "Guide for the Design of Substations for Electric Borrowers." In the purchase of arresters, care should be taken to select the type and voltage ratings in accordance with the line voltage and the type of construction (grounded or ungrounded).

ae - Surge (Lightning) Arresters, Distribution Class

Manufacturer Type; kV Rating; Duty; (Housing)	Conditions
ABB	
HMX; 9, 10, 18 kV; Heavy duty	To obtain experience.
XPH; 9, 10, 18, 27 kV; Heavy duty; (Polymer)	To obtain experience.
Cooper Power Systems	
AZLP; 9, 10, 18, 27 kV; Heavy duty; (Polymer)	To obtain experience.
AZL500 VariGAP; Internally gapped; 9, 10, 18, 27 kV; Heavy duty	To obtain experience.
AZLP500 VariGAP, Internally gapped; 9, 10, 18, 27 kV; Heavy duty; (Polymer)	To obtain experience.
AZS500 VariGAP; Internally gapped; 9, 10, 18, 27 kV	To obtain experience.
AZSP500 VariGAP; Internally gapped; 9, 10, 18, 27 kV; (Polymer)	To obtain experience.
AZS VariSTAR; 9, 10, 18, 27 kV	To obtain experience.
General Electric	
Tranquell, 9L23 Series 9, 10, 18, 27kV; Heavy duty (Polymer)	To obtain experience.
Joslyn	
ZQ; 9, 10, 18, kV	To obtain experience.
ZQP; 9, l0, l8, 27kV Heavy Duty; (Polymer)	To obtain experience.
Ohio Brass	
(DynaVar PDV, Polymer)	To obtain experience.
PDV-65; 9, 10, 18 kV; (Polymer)	To obtain experience.
PDV-100; 9, 10, 18 kV; Heavy duty (Polymer)	To obtain experience.
Raychem Corporation	
HDA Series; 9, 10, 18, 27 kV; (Polymer)	To obtain experience.

NOTES:
1. Either arresters with external top gaps and without ground lead disconnectors or direct connected arresters with ground lead disconnectors may be used as specified by the user.
2. All arresters listed above are normal duty unless otherwise noted.
3. All arresters listed above have porcelain housing unless noted.

Conditional List
ae(2)
July 1995

ae - Surge Arrester, Substation*

Metal Oxide

Manufacturer Classification Type; kV Rating; (Housing)	Conditions
<u>ABB</u>	
Station class SMX-30; 3 thru 312 kV	To obtain experience.
<u>Cooper Power Systems</u>	
Station class VariSTAR 3 thru 312 kV	To obtain experience.
Intermediate class VariSTAR Type AZF; 9 thru 120 kV	To obtain experience.
<u>General Electric</u>	
Station class Tranquell; 2.7 thru 612 kV	To obtain experience.
Intermediate class Tranquell; 3 thru 120 kV	To obtain experience.
<u>Joslyn</u>	
Intermediate class Type ZI; 3 thru 144 kV	To obtain experience.
Station class Type ZS; 3 thru 240 kV	To obtain experience.
Station class Type ZSH; 258 thru 468 kV	To obtain experience.
Intermediate class Type ZIP; 3 thru 120 kV; (Polymer)	To obtain experience.
Station class Type ZSP; 3 thru 144 kV; (Polymer)	To obtain experience.
<u>MagneTek</u>	
Station Class Type ZSE-E2A, 3 thru 39 kV Type ZSE-E3A, 45 thru 312 kV	To obtain experience.

NOTE: All above arresters have porcelain housing unless otherwise noted.

*For instructions concerning application at substations refer to RUS Bulletin 65-1, "Design Guide for Rural Substations." In the purchase of arresters, care should be taken to select the type and voltage rating in accordance with the line voltage and the type of construction (grounded or ungrounded).

ae - Surge Arrester, Substation*

Metal Oxide

Manufacturer Classification Type; kV Rating; (Housing)	Conditions
Ohio Brass	
Station class DynaVar; 3 thru 357 kV	To obtain experience.
Intermediate class DynaVar; 3 thru 120 kV	To obtain experience.
Intermediate class DynaVar Type PVI; 3 thru 108 kV	To obtain experience.
Station class DynaVar Type PVN; 3 thru 144 kV; (Polymer)	To obtain experience.

NOTE: All above arresters have porcelain housing unless otherwise noted.

*For instructions concerning application at substations refer to RUS Bulletin 65-1, "Guide for the Design of Substations." In the purchase of arresters, care should be taken to select the type and voltage rating in accordance with the line voltage and the type of construction (grounded or ungrounded).

af - Cutouts, Distribution, Open

Manufacturer	Type	Voltage Rating
ABB	ICX	15, 27 kV
	LBU-II	15, 27 kV
Chance	C	15, 27, 35 kV
	C (loadbreak)	15, 27, 35 kV
Cooper Power Systems	S1	15, 27 kV
Joslyn	L	15, 27 kV
Kearney	HX	15, 27 kV
Power Line Hardware/ Delmar Manufacturing Co.	DHC	15, 27 kV
S & C Electric	XS	15, 27 kV
Southern States	Series 66	15, 27 kV
	Series 70	15 kV

NOTE: The buyer should specify the load rating, voltage rating, interrupting rating and required accessories.

Cutouts used on underground riser poles should be loadbreak type or have hooks for portable load interrupters.

af - Cutout, open-link fuse support

Manufacturer	Mounting	12.5/7.2 kV 50 amp.	24.9/14.4 kV 50 amp.
Cooper	Crossarm	FT1A2	FT1A4
	Bushing	FT10A3	-
Kearney	Crossarm	6484-55	-
	Bushing	6483-59	-

NOTE: The open link fuse supports listed above are fuse supports only and have no inherent interrupting capacity. They should be used with fuse links capable of interrupting at least 1200 amperes and for transformer protection only.

af - Power Fuses, Substation

Manufacturer	Type	Voltage Rating
ABB	RDB (Boric acid, refillable)	15-34.5
	DBS (Boric acid, non-refillable)	15-34.5
	DBA (Boric acid, refillable)	46-69
Kearney	HX	15
	HX	27
S & C Electric*	XS	15-25
	SMD (Boric Acid)	15-138
Southern States	Series P	15-161

*Available with porcelain insulators. Available with "Cypoxy" cycloaliphatic epoxy insulators 34.5 kV on request.

NOTE: All fuses listed on this page should be furnished with NEMA standard insulators. The buyer should specify the current rating, voltage rating, interrupting rating and required accessories.

af - Cutouts, Distribution, Open with Linkbreak Attachment

Manufacturer	Type	Voltage Rating	Conditions
Chance	C	15, 27 kV	1. To obtain experience. 2. Limited to 100 amp cutouts. 3. To be used only with Chance, Cooper and Kearney fuses. Will not break S&C and some other fuse types.

ag - Fuses, Current Limiting, Backup

Manufacturer	Conditions
ABB 15 kV Class Type CLTX, 25K/15T 25 kV Class fuse 25 K or 15 T or Type CLTX, 25K/15T	1. To obtain experience. 2. Must be used in series with external expulsion smaller or with CSP transformers 50 kVA or smaller.
Chance 15 kV Class Type K-Mate 25 Catalog No. C70L-31KA 25 kV Class Type K-Mate 25 Catalog No. C70L-32KA	Same as above.
Cooper Power Systems 15 kV Class FAH series 25 kV Class FAH series	Same as above.
General Electric 15 kV Class 9F59U Series 25 kV Class 9F59U	Same as above.
High-Tech Fuses 15 kV Class No. HTDE23 (X)025 25 kV Class No. HTDE24 (X)025 35 kV Class No. HTDE25 (X)025	Same as above.

ah - Tie, insulator, formed type

Manufacturer	Type
Carolina Formed Wire	Double support tie(Order for specific conductor size and insulator) Urban tie(Order for specific conductor size and insulator)
Chance	Super Top-Tie, Type STT for single or double support use, with insulators 2-1/4" through 3-1/2" neck diameter and single support use on spool insulators with 1-3/4" groove diameter (Order for specific conductor size.)
Dulmison	LT "Longspan" top tie (Order for specific conductor size and insulator) ST side tie (Order for specific conductor size and insulator) Type SPL* (Side tie for use on spool insulator with 1-3/4" groove) DBST double side tie (Order for specific conductor size and insulator) DST double support tie (Order for specific conductor size and insulator)
Helical Line Products	HTT Series (Order for specific conductor size and insulator)
Preformed Line Products	WT "Wraplock" (Order for specific conductor size and insulator) ST "Groove-Formed" side tie (Order for specific conductor size and insulator) Spool Tie for ACSR, Type SPL* (Side tie for use on spool insulator with 1-3/4" groove) DST double support top tie (Order for specific conductor size and insulator) DBST double side tie (Order for specific conductor size and insulator)

*Not for side mounting on pin or post insulators.

ah - Tie, insulator, formed type

Manufacturer	Conditions
Preformed Line Products EZ-WRAP* spool tie (order for specific conductor size)	To obtain experience.

*Not for side mounting on pin or post insulators.

ai - Rods, Ground

Applicable Size: The standard length is 8 feet and catalog numbers listed below are for this length. Longer rods may be required for special conditions.

Copper-covered ground rods are listed with a 13 mil minimum at any point and a 15 mil average covering of copper. All purchases should specify that a factory certification of the thickness of the copper must accompany the shipment of the rods.

Copper-covered steel rods

	5/8"
Apache	588R
Blackburn	625813MX
Boggs	EB-810-13
Eritech (Carolina Galvanizing/Knight)	615883
Galvan	6258G13
Joslyn	J8338-13
Korns	KCG588-13
Republic Wire	RGC5883
Wilcor	WA588C

Stainless Clad Steel

Manufacturer	5/8"	3/4"
Teledyne (MEFCO)	"PERMAGROUND"	"PERMAGROUND"

ai - Rods, Ground

Applicable Size: The standard length is 8 feet and catalog numbers listed below are for this length. Longer rods may be required for special conditions.

Hot Dip Galvanized Steel

Manufacturer	5/8"	3/4"
Blackburn		GR7508
Boggs	G588	G348
	PTG588**	PTG348**
Chance	8578	8618
	C203-0107**	C203-0109**
	C203-0377*	
Cooper Power Systems	DN5S8	DN6S8
	DN6D8*	
Dixie	D8578	D8618
Erico	G588	G348
	G588PT**	G348PT**
Eritech (Carolina Galvanizing/Knight)	815880	813480
	815889**	813489**
Galvan	GR6258	GR7508
General Electric	0982-00002	0982-00003
Grip-Tite	GT588	GT348
	GT588PT**	GT348PT**
Joslyn	J3358B*	J3458B*
	J5328	J5338
	J5228**	J5238**
Korns	KG58	KG34
Kortick	K4658	K4678
Line Hardware	GR-588G	GR-348G
Lloyd	6258H	7508H
Porcelain Products	7338	7348
Utilities Service	5307	6338
Wilcor	WA8580G	WA8340G

Electro-Galvanized Steel

Apache	G588	G348
	G588PT**	G348PT**
Blackburn	GR6258	-
Calpico	G8580	-
LMP	6258E**	7508E**

Stainless Steel

Teledyne (MEFCO)	TDY Sol	TDY Sol
Wilcor	WA 588-S	WA348-S

*Rod furnished with clamp.
**Rod furnished with 4 ft., No. 6 tinned or galvanized copper pigtail.

ai - Rods, ground, sectional

Galvanized steel and
copper-covered steel

Copper-covered ground rods are listed with a 13 mil minimum at any point and a 15 mil average covering of copper. All purchases should specify that a factory certification of the thickness of the copper must accompany the shipment of the rods. Rods are copper-covered unless marked galvanized steel.

Sectional Ground Rods

Manufacturer	8' long	10' long	Coupling	Driving studs
Blackburn	6258S13MX	6260S13MX	60C 60CNT2*	60DS 60DSNT*
Chance Galv. Steel	C203-0052	8512	8611	-
Cooper Power Systems Galv. Steel	DN17S8	DN16S10	DN1K2	-
Demark Galv. Steel	-	-	GRC 58B* GRC 58G*	-
Eritech (Carolina Galv./Knight)				
	635883	635803	CC-58*	DSH 58
Galv. Steel	835880	835800	GC 58	DSH 58
Galv. Steel	833480	833400		DSH 34
Galvan Galv. Steel	G25GS13	6260GS13	-	-
Joslyn	J9158-13	J9160-13	J9182	J9186
Galv. Steel	J23282.8	J23282.10	J23282A	J9186

*Threadless coupling or drive head

aj - Clamp, Ground Rod

Manufacturer	For 5/8" Copper-Covered Rod	For 3/4" Galv.or Stainless Steel Rod	For 5/8" Galv.or Stainless Steel Rod
AMP	C-LOK Series	81412-1	81412-1
Anderson	GC-5	-	-
Blackburn	G5	-	-
Boggs	G31	-	-
Burndy	GRC58	-	-
C & R Products	CRGC-58	-	-
Connector Castings	G5	-	-
Dossert	GNL62H	-	-
*Erico (Cadweld)			
1 ground wire	GR1-161G	GR1-181G	GR1-161G
2 ground wires	GT1-161G	GT1-181G	GT1-161G
Eritech (Carolina Galv./Knight)	CP 58	UCSS	SS 58
Greaves/Mercury	G-580	-	-
Ilsco	GRC-58	-	-
Joslyn	J8392AB	J25985	J25932
Kortick	K4647	-	-
Lew Electric Fittings	GRC-5/8"	-	-
Line Hardware	RC-58CE	-	-
Penn-Union	CEB-2	-	-
Reliable	E58	3459	3459
Wilcor	HGR5/8	WAU 5834-B	WAU 5834-B

*Includes disposable molds.

aj - Clamp, ground rod

Manufacturer	Conditions
Burndy	
YGHP (for 5/8" copper-covered rods)	To obtain experience.
Line Hardware	
RC-34 (for 5/8" and 3/4") galvanized or stainless steel ground rods	To obtain experience.

al - Staples, ground wire

Applicable Specification: ANSI C135.14, "Standards for Staples with Rolled or Slash Points."

Length x Spread (inches)	1-1/2 x 1/4	2 x 1/2	1-1/2 x 3/8	3 x 1-1/16
Diameter	9 gauge Galv. Steel	8 gauge Galv. Steel	8 gauge Copper-Coated	1/4 Moulding
Apollo	AP52I-S1672G	AP521-S1570	AP501-S6652	AP500-S6497
Chance	C205-0247	C205-0216	9167	9161
Copperweld Southern	-	CP52	-	-
FWC	FW1672G	FW157	FW6652	FW6497
Joslyn	J1672G	J157	J6652	J6497
Kortick	-	-	K247	K236
Larson	-	350453	750233	721312
Lindsey	10248	-	-	10270
Redmore Products	SCSG1525148	SDSG2050162	SCCC1538162	SDSG3090250
Utilities Service	88	86	48	46

Barbed staples, ground wire

Length x Spread (inches)	1-1/2 x 3/8	2 x 5/8	1-1/2 x 3/8	3 x 1-1/16
Diameter	.131 Galv. Steel	.165 Galv. Steel	.140 Copper-Coated	7/32 Galv. Steel
Apollo	AP520-57488HTG	AP50I-S66525		
Joslyn	J7656	J7672	J7682	J7664
Redmore Products		TDSG2063187	TCCC1538162	TDSG3090250

Staples, alumoweld

Length x Spread (inches)	2 x 1/2	1-1/2 x 3/8	3 x1-1/16
Diameter	8 gauge	8 gauge	1/4 moulding
Apollo	AP531-S6655AL	AP531-S6652AL	AP530-S7493AL
Joslyn	-	J6652AL	J-7493AL
Redmore Products			SDAA3090250

Clip, ground wire

Kearney	12326

Conditional List
al(1)
July 1995

al - Staples, Ground Wire

Clip, Ground Wire

Manufacturer	Conditions
Fastex (ITW) No. 780-2	To obtain experience.

an - Transformers, distribution, pole type
Primary Voltages 7.2/12.5, 7.62/13.2 and 14.4/24.9 kV

Applicable Specifications: "RUS Specifications for Rural Distribution Transformers," D-10

Listing is by type rather than by catalog number because of the many possible combinations of voltage, kVA and taps and protective equipment.

	7.2/12.5 & 7.62/13.2	14.4/24.9	Dual Voltage
ABB			
Conventional, single bushing	S-B3	S-B3	S-B3
Self-protected, single bushing	CSP-B3	CSP-B3	CSP-B3
Conventional, two bushing	S-A	S-A	S-A
Type S-B3 may also be obtained with internal fuse, with internal fuse and double gap, and with lightning arrester and open link cutout (Type PC).			
Arkansas Electric Cooperative			
Conventional, single bushing	ASE		
Central Moloney			
Conventional, single bushing	AOD	AOD	AOD
Conventional, two bushing	AOD	AOD	AOD
Self-protected, single bushing	DVP	DVP	DVP
The single bushing transformer may also be obtained with bushing mounted cutout and lightning arrester, and with internal fuse and double gap.			
Cooper Power Systems			
Conventional, single bushing	REA-Conv	REA-Conv	REA-Conv
Self-protected, single bushing	REA-CSP	REA-CSP	REA-CSP
Conventional, two bushing	REA-Conv	REA-Conv	REA-Conv
Conventional single bushing type may also be purchased with external overload protection and double gap and with bushing mounted cutout and lightning arrester.			

an - Transformers, distribution, pole type
Primary Voltages 7.2/12.5, 7.62/13.2 and 14.4/24.9 kV

	7.2/12.5 & 7.62/13.2	14.4/24.9	Dual Voltage
ERMCO			
Conventional, single bushing	CONV	CONV	CONV
Conventional, two bushing	CONV	CONV	CONV
Self-protected, single bushing	CSP	CSP	CSP

The single bushing transformer may also be obtained with double gap and internal fuse (Type DG) or lightning arrester and external pe COLA).

Dead-front for use in enclosure: Add "R" (Radial) or "LF" (Loop feed) to designation.

General Electric			
Conventional, single bushing	HS	HS	HS
Self-protected, single bushing	HSBA	HSBA	HSBA
Conventional, two bushing	HS	HS	HS

Type HS may also be obtained with internal fuse, with internal fuse and double gap, with bushing mounted cutout and double gap, and with bushing mounted cutout arrester (Type HSCA).

Howard Industries			
Conventional, single bushing	REC-C	REC-C	REC-C
Conventional, two bushing	Conv-2B	Conv-2B	Conv-2B
Self-protected, single bushing	REC-P	REC-P	REC-P

Kuhlman			
Conventional, single bushing	I	I	I
Conventional, two bushing	B	B	B
Self-protected, single bushing	H	H	H

Type I may also be purchased with internal fuse, with internal fuse and double gap (Type G), and with bushing mounted cutout and lightning arrester (Type J).

an - Transformers, distribution, pole type
Primary Voltages 7.2/12.5, 7.62/13.2 and 14.4/24.9 kV

	7.2/12.5 & 7.62/13.2	14.4/24.9	Dual Voltage
Magnetic Electric			
Conventional, single bushing	AOD	AOD	AOD
Conventional, two bushing	AOD	AOD	AOD
Self-protected, single bushing	AOD	AOD	AOD
Sesco			
Conventional, single bushing	RU		
Self-protected, single bushing	ESP		
Conventional, two bushing	CONV		
United (Ky. AEC)			
Conventional, single bushing	SC	SC	DSC
Conventional, two bushing	SC	SC	DSC
Self-protected, single bushing	SCP	SCP	DSCP
VanTran			
Conventional, single bushing	CR		
Self-protected, single bushing	CSP-R		
Conventional, two bushing	CD		

Type RU may also be purchased with internal fuse and/or lightning arrester.

SC and DSC may be purchased with external fuse and arrester (SP and DSP)

an - Transformers, Power
Single-Phase, Step-Down
for Distribution Substation Use

Applicable Specification: RUS Specification for Step-Down Substation Transformers, S-3

Transformers with 115 kV and 138 kV primary voltage ratings are with full BIL and with one step reduced BIL.

"X" indicates that acceptable test data have been furnished RUS for this rating and for secondary voltages in either 15 kV or 25 kV class.

All acceptances are based on standard impedances, taps, winding designs, materials and accessories. Variations should not be ordered except under special circumstances. Complete design tests should be specified for special designs.

Primary Voltage-kV	kVA Capacity												
	167	250	333	500	833	1250	1667	2500	3333	5000	6667	8333	10,000
ABB													
34.4					X	X	X	X	X				
43.8					X	X	X	X	X				
67.0					X	X	X	X	X				
115											X		
Central Moloney													
34.4	X	X	X	X									
Cooper Power Systems													
34.4	X	X	X	X	X	X	X						
43.8				X	X	X	X						
67.0			X	X	X	X	X						
General Electric													
34.4	X	X	X	X	X	X	X	X	X				
43.8					X	X	X	X	X				
67.0											X		
115					X	X	X	X	X	X			
138											X	X	X

an - Transformers, Power
Single-Phase, Step-Down
for Distribution Substation Use

Applicable Specification: RUS Specification for Step-Down Substation Transformers, S-3

Transformers with 115 kV and 138 kV primary voltage ratings are with full BIL and with one step reduced BIL.

"X" indicates that acceptable test data have been furnished RUS for this rating and for secondary voltages in either 15 kV or 25 kV class.

All acceptances are based on standard impedances, taps, winding designs, materials and accessories. Variations should not be ordered except under special circumstances. Complete design tests should be specified for special designs.

Primary Voltage-kV	kVA Capacity												
	167	250	333	500	833	1250	1667	2500	3333	5000	6667	8333	10,000
Hevi Duty													
34.4					X	X	X	X					
43.8					X	X	X	X	X				
67.0					X	X	X	X	X	X			
115							X	X	X				
Kuhlman													
34.4					X	X	X	X					
43.8					X	X	X	X	X				
67.0					X	X	X	X	X				
115									X				
MagneTek Electric													
34.4					X	X							
43.8							X						

an - Transformers, Power
Three-Phase, Step-Down
For Distribution Substation Use

	kVA						MVA							
Primary Voltage-kV	750	1000	1500	2000	2500	3750	5	7.5	10	12	15	20	25	30
ABB														
34.4		X	X	X	X	X	X	X	X				X	
43.8		X	X	X	X	X	X	X	X	X	X			
67.0	X	X	X	X	X	X	X	X	X	X	X	X		
115								X	X	X	X	X	X	
138									X	X	X	X		

Transformers 5 MVA and larger also accepted as load tap changing transformers using ABB Types UTS-A, UTT-B and UVW load tap changers.

Cooper Power Systems														
34.4		X		X	X	X	X	X	X	X				
43.8		X		X	X	X	X	X	X	X				
67.0		X		X	X	X	X	X	X	X				
115										X	X		X	
138											X			

Transformers 5 MVA and larger also accepted as load tap changing transformers using Cooper Types 550, 550B, and 550C load tap changers.

General Electric														
34.4	X	X		X	X	X	X	X	X	X	X	X		
43.8	X	X		X	X	X	X	X	X	X	X			
67.0	X	X		X	X	X	X	X	X	X	X	X	X	X
115							X	X	X	X	X		X	
138							X		X	X	X	X	X	X

Transformers 5 MVA and larger also accepted as load tap changing transformers using General Electric Types LR72, LR65 and LRT-200 load tap changers.

an - Transformers, Power
Three-Phase, Step-Down
For Distribution Substation Use

	kVA						MVA							
Primary Voltage-kV	750	1000	1500	2000	2500	3750	5	7.5	10	12	15	20	25	30
Hevi-Duty														
34.4		X	X		X	X	X	X	X	X	X			
43.8						X	X	X	X	X	X	X	X	
67.0		X	X		X	X	X	X	X	X	X	X		
115						X	X	X	X	X	X	X		
138								X	X	X			X	

Transformers 5 MVA and larger also accepted as load tap changing transformers using ASEA Type UZE and Reinhausen RMT-1 load tap changers.

Kuhlman														
34.4					X	X	X	X	X	X	X		X	
43.8					X	X	X	X	X		X	X		
67.0					X	X	X	X	X	X	X	X		
115							X	X	X	X	X	X	X	
138							X	X	X	X	X	X		X

Transformers 5 MVA and larger also accepted as load tap changing transformers using Siemans-Allis Types TLS and TLH-21 load tap changers.

MagneTek Electric														
34.4							X	X	X	X	X			
43.8									X					
67.0					X	X	X	X	X	X	X	X	X	X
115							X	X	X	X	X	X		X
138							X	X	X	X			X	X

Transformers 5 MVA also accepted as load tap changing transformers using ASEA Electric Type UZD load tap changers.

North American Transformer														
67.0							X			X	X	X	X	
115										X	X		X	X
138										X	X	X	X	X

Transformers 5 MVA and larger also accepted as load tap changing transformers using North American type TC-525 load tap changers.

Conditional List
an(1.1)
July 1995

an - Transformers, Distribution, Pole Type

Manufacturer	Conditions
ABB 7.2/12.5, 7.62/13.2 14.4/24.9 kV & Dual Voltage	
Single-phase, single bushing, 25 and 50 kVA pole type distribution transformers with amorphous metal cores.	To obtain experience.
Single-phase, single bushing and two-bushing with internal UMX Under-oil Arrester or with internal "Tranquell" Under-oil Arrester.	To obtain experience.
Cooper Power Systems 7.2/12.5, 7.62/13.2, 14.4/24.9 kV and Dual Voltage	
Single-phase, single bushing, self-protected, with Magnex Interrupter	To obtain experience.
Above or Conventional, single or two bushing; Type REA Conv. or Self-protected, single bushing Type REA-CSP with Type AZU, MOV, heavy-duty under-oil arrester.	To obtain experience.
Ermco 7.2/12.5 and 7.62/13.2 and14.4/24.9 kV	
Single-phase, single bushing with internal Tranquell Under-oil Arrester	To obtain experience.

an - Transformers, Distribution, Pole Type

Manufacturer	Conditions
General Electric 7.2/12.5, 7.62/13.2, 14.4/24.9 kV and Dual Voltage	
Single-phase, single bushing, and two bushing with internal Tranquell under-oil arrester	To obtain experience.
Single-phase, single bushing and two bushing, 10 - 50 kVA pole type distribution transformers with amorphous metal cores	To obtain experience.
Single-phase, single bushing and two bushing pole type distribution transformers with G.E. high voltage switch	To obtain experience.
Howard Industries 7.2/12.5, 7.62/13.2, 14.4/24.9 kV and Dual Voltage	
Single-phase, single bushing, and two bushing with internal"AZU" or "Tranquell" under-oil arrester	To obtain experience.
Single-phase, single bushing, and two bushing; 5 - 50 kVA; with or without taps, with amorphous metal cores	To obtain experience.
Kuhlman 7.2/12.5 kV and 7.62/13.2 kV Toroform design 10, l5, & 25 kVA	To obtain experience.
NECO 7.2/12.5 kV and 14.4/24.9 kV Single-phase, two bushing, 10-50 kVA, Conventional	To obtain experience.
Prolec S.A. de C.V. 14.4 kV; 10 through 50 kVA Conventional & self-protected	To obtain experience.
VanTran 14.4/24.9 kV and Dual Voltage	
Conventional, single bushing Type CR	To obtain experience.
Conventional, two bushing Type CD	To obtain experience.
Self-protected, single bushing Type CSP-R	To obtain experience.

Conditional List
an(1.3)
July 1995

an - Transformers, Distribution, Pole Type
with non-porcelain secondary bushings

Manufacturer	Conditions
ERMCO Fully or conditionally accepted with Central Moloney polymer secondary bushings	To obtain experience.
Howard Industries Fully or conditionally accepted with Central Moloney polymer secondary bushings	To obtain experience.

an - Transformers, Power
Single-Phase, Step-Down
For Distribution Substation Use

Condition of Acceptance: To obtain experience.

Transformers with 115 kV and 138 kV primary voltage ratings are acceptable with full BIL and with one step reduced BIL.
"X" indicates that acceptable test data have been furnished RUS for this rating and for secondary voltages in either 15 kV or 25 kV class.
"s" indicates that performance specifications have been furnished RUS and test data are to be submitted when available.

Voltage-kV	kVA Capacity 167	250	333	500	833	1250	1667	2500	3333	5000	6667	8333	10,000
ABB													
34.4									s		s		
43.									s		s		
67.0										s		s	
Cooper Power Systems													
34.4				s			s	s	s		s	s	s
43.8	s	s	s					s	s		s	s	s
67.0	s	s						s	s		s	s	s
Delta-Star													
34.4	s	s	s	s	X	X	s						
43.8	X	s	X	X	s	s	s	X					
67.0	X	s	X	X	s	s	s						
115							s	s	s	s	s	s	s
ESCO													
34.4	X			X	X								
Ferranti-Packard													
67.0		s	s	s	s	X	s	s	s				
General Electric													
43.8										s			
115												s	s
Hevi-Duty													
34.4									s	s	s	s	s
43.8										s	s	s	s
67.00										s	s		s
115										s	s	s	s
MagneTek													
67.0							s						

an - Transformers, Power
Three-Phase, Step-Down
For Distribution Substation Use
Condition of Acceptance: To obtain experience.

	kVA						MVA							
Primary Voltage-kV	750	1000	1500	2000	2500	3750	5	7.5	10	12	15	20	25	30
ABB														
34.4	s									s	s	s		s
43.8	s											s	s	s
67.0														s
115							s							s
138							s	s	s					

Transformers 5 MVA and larger also accepted as load tap changing transformers using ABB Types UTS-A and UVW load tap changers.

Cooper Power Systems														
34.4	s		s	s							s	s	s	s
43.8	s		s								s	s	s	s
67.0	s		s								s	s	s	s
115							s	s	s			s		s
138									s	s		s	s	s

Transformers 5 MVA and larger also accepted as load tap changing transformers using Cooper Types 550, 550B, and 550C load tap changers.

Delta Star														
34.4	s	s	s		s	X	X	X	s					
43.8			s	s	s	X	X	X	s	X				
67.0		s	s	s	X	X	X	X	X	X	X			
115							X	X	s	X	X			
138							s	s	s		s	s	s	s

Transformers 5 MVA and larger also accepted as load tap changing transformers using Seimens-Allis Types TLS, TLH-21 load tap changers.

Pauwels Canada														
115											X			

Ferranti-Packard														
34.4	s	s	s	s	X	s	s							
67.0	s	s	s	s	s	s	X		s	s				

an - Transformers, Power
Three-Phase, Step-Down
For Distribution Substation Use
Condition of Acceptance: To obtain experience.

	kVA						MVA							
Primary Voltage-kV	750	1000	1500	2000	2500	3750	5	7.5	10	12	15	20	25	30
General Electric														
34.4													s	s
43.8												s	s	s
115												s		s
138								s						

Transformers 5 MVA and larger also accepted as load tap changing transformers using General Electric Types LR72, LR65 and LRT-200 load tap changers.

Hevi-Duty														
34.4	s			s								s	s	s
43.8	s	s	s	s	s									s
67.0													s	s
115													s	s
138							s				s	s		s

Transformers 5 MVA and larger also accepted as load tap changing transformers using ASEA Type UZE and Reinhausen RMT-1 load tap changers.

MGM														
34.4					s	X	s	s	s					
43.8					X	X	s	s	s					
67.0					s	s	X	X	s					

Transformers 5 MVA and larger also accepted as load tap changing transformers using ABB Types UTS-A and UTT-B load tap changers.

MagneTek														
115													s	
138											s	s		

Transformers 5 MVA and larger also accepted as load tap changing transformers using ASEA Electric Type UZD load tap changers.

Uptegraff														
34.4	s	s	s	s	s	X	X							
43.8	s	s	s	s	s		X							

Conditional List
an(4)
July 1995

an - Transformers, Step Ratio, Single Phase,
Autotransformers or Two-Winding Transformers
for Use in System Voltage Conversion

Condition of Acceptance: To obtain experience.

Manufacturer	Designation	Size
ABB		
2-WND	"Jumbo"	167-500
Central Moloney		
2-WND	AOD	167-500
Cooper Power Systems		
2-WND	"Round-Coil"	167-500
AUTO	MEPS-AUTO	167-1000
Delta Star		
2-WND	LTD	167-500
AUTO	LTD-A	167-1000
General Electric		
2-WND	HS STEP	167-500
AUTO	HS STEP	167-1000
Howard Industries		
2-WND	STEPS	167-500

NOTE: Two-winding transformers are self-protected under external short circuit in accordance with ANSI C57.12.90A. Auto-transformers will withstand 25 times rated current under external short circuit in accordance with ANSI C57.12.90A.

ao - Bolt, strand eye, straight (thimble eye)

Applicable Specification: ANSI C135.4, "Standards for Galvanized Ferrous Eye Bolts and Nuts for Overhead Line Construction."

Applicable Sizes : 5/8 inch, 6 through 12 inch length 3/4 inch, 8 through 12 inch length

The following manufacturers have shown compliance with the applicable specification:

A. B. Chance Company
*Cooper Power Systems
Dixie Electrical Manufacturing Company
Joslyn Mfg. and Supply Company
Kortick Manufacturing Company
Utilities Service Company

*"Static proof" designs available.

ap - Clamp, hot line
Copper and Copperweld-copper Conductor
(Clamps with internal springs and enclosed threads)

Conductor	
Copper	6 thru 2/0
Copperweld-copper	8A thru 2A
Anderson	BC-2/0
Blackburn	HLC 2108
Chance	S1520CC
Fargo	GH-100S
	GH-201 (For use with CL Fuse)
Ideal	3532
Penn-Union	HLC-020-LS

ap - Clamp, hot line
ACSR with armor rods

Clamps listed below have spring action and enclosed thread chambers.

Conductor Size		4/0 & 3/0	2/0	1/0 & 2	4
	Tap Conductor				
Anderson	Aluminum	AC-800	AC-500	AC-500	AC-500
	Copper	AC-800-GP	AC-500-GP	AC-500-GP	AC-500-GP
Chance	Aluminum	S1540-AA	S1540-AA	S1530-AA	S1530-AA
	Copper	S1540-AC	S1540-AC	S1530-AC	S1530-AC
Connector Mfg.	Aluminum	HL 4/0			
Fargo	Aluminum	GH-202AL	GH-202AL	GH-101A	GH-101A
	Copper	GH-102AC	GH-102AC	GH-101AC	GH-101AC
Penn Union	Aluminum	-	-	HLCA-040	HLCA-040
	Copper			HLCA-040	HLCA-040
Utilco	Aluminum	-	HLC-397	-	HLC-40

ar - Wireholder

Applicable Specification: "RUS Specification for Service Wireholders," D-15

	With #22 Wood Screw	With 3/8" x 5" Bolt
Blackburn	SW3	-
Chance	3-11-44	-
Cooper Power Systems	DW2R9	-
Dixie	D3-11-44	-
Joslyn	J089	-
Porcelain Products	1986	-

NOTE: For Triplex type service cable see clevis type wireholders on page bt-1.

ar - Wireholder
(with #22 wood screw)

Manufacturer	Conditions
Joslyn J089Z (nylon alloy)	To obtain experience.

as - Clevis, service swinging

Applicable Specifications: "RUS Specifications for Service Swinging Clevises," D-7

	Clevis Only*	Clevis with Wet Process Spool	Clevis with Dry Process Spool
Chance	1948C	1948C-C909-1031	1948C-0606
Cooper Power Systems	DC7S2	-	-
Dixie	D1938	D1938-C	D1948-C
Joslyn	J1614	-	J1615
Kortick	K9260	K9141	K9142
Utilities Service	32003	31003	31004

*Catalog number does not include spool; for spool insulators see Item cm.

at - Guy Marker, 8 Foot Length

Manufacturer	Steel Full Round	Steel Half Round
Cooper Power Systems	DG15G1	DG5G3
Joslyn	J1618	J1528
Kortick	K3729	-

at - Guy Marker
8 Foot Length
Plastic or Fiberglass

Manufacturer	Catalog Number
Auburn Extrusions	TK-808 (Yellow) (with bolt type clamp)
Chance	96-PBG-2 (Gray) 96-PBG-2Y (Yellow) 96-PBG-2ORG (Orange)
Chance*	96-FRPMR-GRY (Gray) 96-FRPMR-YEL (Yellow) 96-FRPMR-ORG (Orange) 96-FRPMR-GRN (Green)
Custom Plastics	CPUGGSH
Dulmison*	HGG-OL8Y-C (Yellow)
Electrical Materials*	70-7G (Gray) 70-7Y (Yellow) 70-7O (Orange)
Joslyn	J1491Y (Yellow) J1491G (Gray)
Joslyn*	J5518 (Yellow) J5508 (Gray)
Mangrum	R-8-Y
Preformed Line Products*	PG-5508 (Gray) PG-5518 (Yellow)
Radar*	6032B (Yellow)
Vaughn*	003-7140 (Gray) 004-7140 (Yellow) 005-7140 (White)
Virginia Plastics*	TG-137-8G (Gray) TG-137-8Y (Yellow)
Virginia Plastics**	FG-8G (Gray) FG-8Y (Yellow)

* For use with formed or automatic type deadends for guy strand; will not fit over bolt type guy clamps.

** Available with either 1 or 2 bolt clamps.

Conditional List
at(1)
July 1995

at - Reflective Guy Marker, 8-foot length

Plastic or Fiberglass

Manufacturer	Conditions
*Nordic HG-815 yellow	To obtain experience.

*For use with formed or automatic type deadends for guy strand; will not fit over bolt type guy clamps.

av - Conductor, ACSR

Applicable Specification: ASTM Specification B 232

Preferred Sizes: (Larger sizes may be used where the engineer's study shows they are required.)	Distribution	Transmission
	4 - 6/1	1/0 - 6/1
	4 - 7/1	2/0 - 6/1
	2 - 6/1	3/0 - 6/1
	2 - 7/1	4/0 - 6/1
	1/0 - 6/1	266.8 kcmil - 26/7
	2/0 - 6/1	336.4 kcmil - 26/7
	3/0 - 6/1	477 kcmil - 26/7
	4/0 - 6/1	556.5 kcmil - 26/7
	266.8 kcmil 18/1	795 kcmil - 26/7
	336.4 kcmil 18/1	954 kcmil - 54/7
	477 kcmil 18/1	

The following manufacturers have shown compliance with the applicable specifications:

ACPC, Inc.
Alcan Cable
Alcatel Canada Wire
Cablec
Condumex
Nehring
Noranda
Pirelli Cable
Southwire

NOTES

1. Conductors with 18/1 stranding have different sag characteristics than conductors with 6/1 or 26/7 stranding. This difference in sag characteristics must be taken into consideration in the line design.

2. 266.8 kcmil 26/7, 336.4 kcmil 26/7, and 477 kcmil 26/7 may be used for distribution underbuild on transmission lines.

av - Conductor, copper

Applicable Specifications: ASTM Specification B1 for hard-drawn solid
ASTM Specification B8 for hard drawn stranded and soft stranded
ASTM specification B3 for soft or annealed solid.

Preferred Sizes:

Hard-drawn solid	4 and 6
Soft or annealed solid	4 and 6
Hard-drawn stranded	2x3, 1/0 x 7, 2/0 x 7
Soft stranded	4 and 6

The following manufacturers have shown compliance with the applicable specifications:

Cablec

Condumex

General Cable

Nehring

Republic Wire

Rome Cable

Seal Wire Company

Service Wire Company

Southwire

av - Conductor, Copperweld-copper

Applicable Specification: ASTM Specification B 229

Preferred Sizes:	Distribution	Transmission
	8A	1/0 F
	6A	2/0 F
	4A	3/0 F
	2A	4/0 F

The following manufacturers have shown compliance with the applicable specification for the sizes indicated:

Copperweld Southern	(All sizes)
Southwire	(2A and smaller)

av - Conductor, Service
(Single Conductor)

Manufacturer	Aluminum	Copper
Alcan Cable	x	
Alcatel Canada Wire	x	
Cablec	x	x
Condumex	x	x
Nehring	x	
Pirelli Cable	x	x
Rome Cable	x	x
Southwire	x	x

Applicable Specification: ICEA-NEMA Standard S-66-524

Insulation: Cross-linked thermosetting polyethylene or equal.

Conductor: MHD copper or HD (Aluminum 1350) aluminum
(Compact or compressed stranded conductor is acceptable.)

Marking: Manufacturer's name and type of insulation shall be clearly shown in durable markings on the surface of the insulation at intervals no greater than 24 inches.

av - Conductor, Service Cable
(Triplex and Quadruplex)

Manufacturer	Aluminum	Copper
ACPC, Inc.	x	
Alcan Cable	x	
Alcatel Canada Wire	x	
Cablec	x	x
Condumex	x	x
Hendrix	x	x
Nehring	x	
Pirelli Cable	x	x
Rome Cable	x	x
Southwire	x	x

Applicable Specifications: RUS Specification D-2, Specifications for 600 Volt Neutral-Supported Secondary Service Drop Cables.

av - Conductor, Aluminum Alloy

Applicable Specification: ASTM Specification B399

Preferred Sizes:

DISTRIBUTION		TRANSMISSION	
6201	ACSR Equiv.	6201	ACSR Equiv.
48,690 cmil - 7 str.*	4	123,300 cmil - 7 str.**	1/0
77,470 cmil - 7 str.*	2	155,400 cmil - 7 str.**	2/0
123,300 cmil - 7 str.	1/0	195,700 cmil - 7 str.**	3/0
155,400 cmil - 7 str.	2/0	246,900 cmil - 7 str.	4/0
195,700 cmil - 7 str.	3/0	312,800 cmil - 19 str.	266,800 cmil
246,900 cmil - 7 str.	4/0	394,500 cmil - 19 str.	336,400 cmil
		559,500 cmil - 19 str.	477,000 cmil
		652,400 cmil - 19 str.	556,500 cmil
		927,200 cmil - 37 str.	795,000 cmil

*Not recommended for multiphase lines with span lengths exceeding 300 ft.

**Not recommended for suspension type construction.

The following manufacturers have shown compliance with the applicable specifications:

Manufacturer	Type
ACPC, Inc.	6201
Alcan	6201
Cablec	6201
Southwire	6201

av - conductor

Manufacturer	Conditions
ACPC, Inc. 795 kcmil 26/7 ACSR/AW	To obtain experience.
T-2 type, with ACSR or AAAC (6201) conductors using preferred conductor sizes.	1. To obtain experience. 2. Conductor handling and installation shall be in accordance with manufacturer's recommendations.
Alcan Cable Duplex type, with ACSR or AAAC (6201) conductors using preferred conductor sizes.	1. To obtain experience. 2. Conductor handling and installation shall be in accordance with manufacturer's recommendations.
Cablec T-2 type, with ACSR or AAAC (6201) conductors using preferred conductor sizes.	1. To obtain experience. 2. Conductor handling and installation shall be in accordance with manufacturer's recommendations.
Copperweld Southern Alumoweld-aluminum 6/1 ACSR/AW, 2, 1/0, 2/0, 4/0 4/3 AWAC, 4, 2, 1/0	To obtain experience.
Southwire VR type, with ACSR or AAAC (6201) conductors using preferred conductor sizes.	1. To obtain experience. 2. Conductor handling and installation shall be in accordance with manufacturer's recommendations.

aw - Washer, Spring

1/4" x 1-3/4" x 3-1/2"

	Bolt Size		
Manufacturer	5/8"	3/4"	7/8"
Chance	3540	3541	--
Cooper Power Systems	DF17W3	DF17W4	DF17W5
Flagg	F130	F132	F134
Joslyn	J3540	J3541	J3542
Kortick	K2909	--	--
Line Hardware	SCW-58	SCW-34	SCW-78

Nominal System Voltage		For 12.5Y/7.2 kV			For 13.2Y/7.6 kV		For 24.9Y/14.4 kV	
Cutout Max. Voltage Rating		7.8 kV		15 kV	15 kV		18 kV	27 kV
Application		1ø Trans.	1ø Sect.	3ø Bank 3ø Sect.	1ø Trans.	3ø Bank 3ø Sect. 1ø Sect.	1ø Trans.	3ø Bank 3ø Sect. 1ø Sect.
Cutout Current Rating		50*	100	100	50*	100	50*	100
Manufacturer	Type Mounting	Catalog Numbers						
ABB	Crossarm Crossarm (L)		7.8 NCX/9 LVG 7.8 LBU-II/9 LVG	15 NCX/10 LVG 15 LBU-II/10 LVG		15 NCX/10 LVG 15 LBU-II/10 LVG		24.9 NCX/18 LVG 24.9 LBU-II/18 LVG
Chance	Crossarm Transformer		C7 Series	C7 Series		C7 Series		C7 Series
Cooper	Crossarm (L) Transformer	AFZS110M010	AFZS510B Series	AFZS510C Series	AFZS110M010	AFZS510C Series	AFZS110M018	AFZS518D Series
General Electric	Crossarm (L) Transformer	9F78A	9F80	9F80	9F78A	9F80	9F78A	9F80
Joslyn(valve) (valve) (valve)	Crossarm Crossarm (L) Transformer	J9238-1Q	415402-09Q J9237-Q2/B	415402-09Q J9237-Q2/B/R J9238-1Q		415402-09Q J9237-Q2/B/R J9268-1Q		425703-198Q J9267-Q2/B
Kearney	Crossarm Transformer	294072		KE3AB110E-110	294073	KE4AB110E-110	294074	KE7BD109E-110

Either normal duty or heavy duty distribution class arresters listed on page ae-1 are acceptable for use with these combination units.

*These cutouts have open links and must not be used where fault currents are high or for sectionalizing.

(L) Indicates loadbreak type is available.

az - Pole Numbers and Letters, Metal

(See Drawing M52-3)

Manufacturer	Catalog No.
Almetek Industries, Inc.	"E-Z Tags" Order by description
Premax Products	1523
Tech Products	Everlast Tag

ba - Bolt, Angle Eye

Thimble Type

Applicable Specification: ANSI C135.4, "Standards for Galvanized Ferrous Eye Bolts and Nuts for Overhead Line Construction."

Applicable Sizes : 5/8 inch, 6 through 12 inch length
3/4 inch, 8 through 12 inch length

The following manufacturers have shown compliance with the applicable specifications:

A. B. Chance Company
*Cooper Power Systems
Dixie Electrical Manufacturing Company
Joslyn Mfg. and Supply Company
Kortick Manufacturing Company
Utilities Service Company

*"Static proof" designs available.

bb - Brace, sidearm vertical

	26" brace 24" bolt-hole spacing	50" brace 24" bolt-hole spacing
Cooper Power Systems	DB1V1	DB1V3
Dixie	D6986	D6987
Joslyn	J1536	J1537
Kortick	K1931	K1932
Utilities Service	5249	5250

be - Reclosers, oil and vacuum

Mfr	Phases	Type	Circuit Voltage	Continuous Rating	Int. Rating	Oil/ Vacuum	Hydraulic/ Electronic
Cooper	1	H	12.5/7.2	5-50	1250	O	H
	1	4H	12.5/7.2	5-100	2000	O	H
	1	L	12.5/7.2	25-100	4000	O	H
	3	6H	12.5/7.2	5-100	2000	O	H
	3	W	12.5/7.2	100-560	10,000	O	H
	3	WE	12.5/7.2	560	10,000	O	H
	3	VSA-12	12.5/7.2	100-560	12,000	V	E
	1	E	24.9/14.4	5-100	2500	O	H
		(Type E available with shunt lockout solenoid for three-phase operation)					
	1	4E	24.9/14.4	50-200	4000	O	H
	3	WV	34.5/19.9	560	8000	O	H
	3	WVE	34.5/19.9	560	8000	O	E
Lexington Switch and Controls	1	A Line Model B	12.5/7.2	5-50	1250	O	H
	1	A Line Model D	12.5/7.2	25-100	2000	O	H
	1	A Line Model K	12.5/7.2	25-100	4000	O	H

NOTES:

1. Series trip reclosers with ratings greater than 100 amp for 12.5/7.2 kV application, greater than 200 amp for 24.9/14.4 kV application, and 280 amp for 34.5/19.9 kV application are acceptable only with ground trip device. Shunt trip reclosers without ground trip devices may not be used with trip settings higher than 200 amp for 12.5/7.2 kV application, greater than 400 amp for 24.9/14.4 kV application, and 560 amp for 34.5/19.9 kV application.

2. Reclosers are not acceptable with load current, bushing CT battery chargers.

Conditional List
be(1)
July 1995

be - Recloser, oil circuit
12.5/7.2 kV

Manufacturer	Conditions
ABB Three phase oil circuit recloser (Shunt trip with static or relay type controls)	
Type ES-400 (15-400 amperes) Type ES-560 (15-560 amperes) Type ESM-560 (100-560 amperes) Type ES-105 (15-560 amperes)	To obtain experience.
Cooper Power Systems Single phase, Type D rated 100 amperes continuous, 10,000 amperes symmetrical	To obtain experience.
Lexington Switch and Controls Three phase oil circuit recloser, 50,100 and 280 ampere frames. A Line, Model 3B (5-50 amperes) Model 3D (5-100 amperes) Model 3K (25-280 amperes)	To obtain experience.

24.9/14.4 kV

Lexington Switch and Controls Oil circuit recloser, Single phase-A Line, Model M rated 100 amperes Three phase-A Line, Model 3M rated 100 amperes	To obtain experience.

34.5/19.9 kV

Cooper Power Systems Single phase, Type DV rated 100-280 amperes continuous, 8,000 amperes symmetrical	To obtain experience.

NOTES:

1. Series trip reclosers with ratings greater than 100 amp for 12.5/7.2 kV application, greater than 200 amp for 24.9/14.4 kV application, and 280 amp for 34.5/19.9 kV application are acceptable only with ground trip device. Shunt trip reclosers without ground trip devices may not be used with trip settings higher than 200 amp for 12.5/7.2 kV application, greater than 400 amp for 24.9/14.4 kV application, and 560 amp for 34.5/19.9 kV application.

2. Reclosers are not acceptable with load current, bushing CT battery chargers.

be - Reclosers, vacuum interrupter

Manufacturer	Conditions
ABB	
Three phase Type ESVA rated 560/800 amps continuous, 12,000 amps symmetrical, maximum voltage 15.5 kV for 12.5/7.2 kV	To obtain experience.
Three phase Type ESMVA rated 560 amps continuous, 16,000 amps symmetrical, maximum voltage 15.5 kV for 12.5/7.2 kV	To obtain experience.
Three phase Type ESV rated 800 amps continuous, maximum voltage 38 kV 24.9/14.4 kV	To obtain experience.
Cooper Power Systems	
Single phase, Type V4H rated 5-100 amperes continuous, 2,000 amperes symmetrical, maximum voltage 15.5 kV for 12.5/7.2 and 13.2/7.62 kV	To obtain experience.
Single phase, Type V4L rated 50-100 amperes continuous, 6,000 amperes symmetrical, maximum voltage 15.5 kV for 12.5/7.2 and 13.2/7.62 kV	To obtain experience.
Three phase, Type V6H rated 5-100 amperes continuous, 2,000 amperes symmetrical, maximum voltage 15.5 kV for 12.5/7.2 and 13.2/7.62 kV	To obtain experience.

NOTES:

1. Series trip reclosers with ratings greater than 100 amp for 12.5/7.2 kV application, greater than 200 amp for 24.9/14.4 kV application, and 280 amp for 34.5/19.9 kV application are acceptable only with ground trip device. Shunt trip reclosers without ground trip devices may not be used with trip settings higher than 200 amp for 12.5/7.2 kV application, greater than 400 amp for 24.9/14.4 kV application, and 560 amp for 34.5/19.9 kV application.

2. Reclosers are not acceptable with load current, bushing CT battery chargers.

Conditional List
be(2.1)
July 1995

be - Recloser vacuum interrupter

Manufacturer	Conditions
Cooper Power Systems	
Three phase, Type VW rated 560 amperes continuous, 2,000 amperes symmetical, maximum voltage 15.5 kV for 12.5/7.2 and 13.2/7.62 kV	To obtain experience.
Three phase, Type VWE rated 560 amperes continuous, 12,000 amperes symmetrical, maximum voltage 15.5 kV for 12.5/7.2 and 13.2/7.62 kV	To obtain experience.
Three phase, Type VSA-16 rated 560 amperes continuous, 16,000 amperes symmetrical, maximum voltage 15.5 kV for 12.5/7.2 and 13.2/7.62 kV	To obtain experience.
Three phase, Type VWV27 rated 560 amperes continuous 12,000 amperes symmetrical, maximum voltage 27 kV for 24.9/14.4 kV	To obtain experience.
Three phase, Type VWVE27 rated 560 amperes continuous, 12,000 amperes symmetrical, maximum voltage 27 kV for 24.9/14.4 kV	To obtain experience.
Three phase, Type VWV38 rated 50-560 amperes continuous, 12,000 amperes symmetrical, maximum voltage 38 kV for34.5/19.9 kV	To obtain experience.

NOTES:

1. Series trip reclosers with ratings greater than 100 amp for 12.5/7.2 kV application, greater than 200 amp for 24.9/14.4 kV application, and 280 amp for 34.5/19.9 kV application are acceptable only with ground trip device. Shunt trip reclosers without ground trip devices may not be used with trip settings higher than 200 amp for 12.5/7.2 kV application, greater than 400 amp for 24.9/14.4 kV application, and 560 amp for 34.5/19.9 kV application.

2. Reclosers are not acceptable with load current, bushing CT battery chargers.

be - Recloser, vacuum interrupter

Manufacturer	Conditions
Cooper Power Systems	
Three phase, Type VWVE38 rated 560 amperes continuous, 12,000 amperes symmetrical, maximum voltage 38 kV for 34.5/19.9 kV	To obtain experience.
Three phase, Type VSO-12 rated 560 amperes continuous, 12,000 amperes symmetrical, maximum voltage 38 kV for 34.5/19.9 kV	To obtain experience.
Three phase, Type VSO-16 rated 560 amperes continuous, 12,000 amperes symmetrical, maximum voltage 38 kV for 34.5/19.9 kV	To obtain experience.
Single phase, type VXE electronically controlled, vacuum interrupting, rated 10-200 amps continuous, 8000 amperes symmetrical, maximum voltage of 15.5 kV for 12.5/7.2 kV & 27 kV for 24.9/14.4 kV systems	To obtain experience.
Joslyn	
Three phase, Type JVR, SF6 insulation, rated 400 amps continuous, 6,000 amperes symmetrical, maximum voltage 15 kV for 12.5/7.2 kV	To obtain experience.
Lexington Switch	
Single phase, type EV627 rated 400 amp continuous, 6000 amp interrupting, maximum voltage 27 kV for 24.9/14.4 kV	To obtain experience.
Single phase, type EV815 rated 400 amp continuous, 8000 amp continuous, maximum voltage 15.5 kV for 12.9/14.4 kV	To obtain experience.

NOTES:

1. Series trip reclosers with ratings greater than 100 amp for 12.5/7.2 kV application, greater than 200 amp for 24.9/14.4 kV application, and 280 amp for 34.5/19.9 kV application are acceptable only with ground trip device. Shunt trip reclosers without ground trip devices may not be used with trip settings higher than 200 amp for 12.5/7.2 kV application, greater than 400 amp for 24.9/14.4 kV application, and 560 amp for 34.5/19.9 kV application.

2. Reclosers are not acceptable with load current, bushing CT battery chargers.

Conditional List
be(3)
July 1995

be - Recloser, SF6 interrupter

Manufacturer	Conditions
Chance Single phase, Type SPR rated 280 amperes continuous, 4,000 amperes symmetrical, maximum voltage 15.5 kV for 12.5/7.2 kV	To obtain experience.

NOTES:

1. Series trip reclosers with ratings greater than 100 amp for 12.5/7.2 kV application, greater than 200 amp for 24.9/14.4 kV application, and 280 amp for 34.5/19.9 kV application are acceptable only with ground trip device. Shunt trip reclosers without ground trip devices may not be used with trip settings higher than 200 amp for 12.5/7.2 kV application, greater than 400 amp for 24.9/14.4 kV application, and 560 amp for 34.5/19.9 kV application.

2. Reclosers are not acceptable with load current, bushing CT battery chargers.

bh - Clevis, Service Deadend

Applicable Specification: "RUS Specification for Service Deadend Clevises," D-8

Manufacturer	Clevis Only*	Clevis with dry process spool	Clevis with wet process spool
Chance	0341	0341-0606	0341-C909-1931
Cooper Power Systems	DC3F1	-	-
Dixie	D0341	D0341-D	D0341-W
Joslyn	J0313	J0314	-
Kortick	K9250	K9100	K9099
Utilities Service	32136	31136	36136

*Catalog number does not include spool; for spool see Page cm.

bi - Gain, Pole

For use with rectangular crossarms

Chance	4092
Continental	CAG-44-5
Flagg (MIF)	PX252

For braceless crossarms (narrow profile construction)

Continental	DEA-65-10A
Flagg (MIF)	PX182A
Reliable/Bethea	GCAF-6A

Transmission

Grid Gains

	Sizes in inches	
	4" x 4"	4" x 9"
Chance	PG44	PG945
Continental	GGSF-4040-7	GRF-9045-7
Flagg (MIF)	PX122	PX260
Hughes Brothers	1263	1260
Joslyn	J6064	
Reliable/Bethea	GSF-44-7	GSFT-95-7

bj - Guy Hook

Applicable Specification: Edison Electric Institute Specification TD-11 1951, "Specifications for Guy Hooks and Guy Strain Plates."

Chance	6584
Cooper Power Systems	DG4H1
Dixie	D6584
Joslyn	J1019
Kortick	K4031
Utilities Service	5310

bk - Guy Plate

Applicable Specifications:

Strain Type: Edison Electric Institute Specification TD-11 1951, "Specifications for Guy Hooks and Guy Strain Plates."

Lift Type: None

	Strain Type 4" x 8" x 14 gage	Lift Type 2-1/2" x 7" x 1/4", 2 hole
Chance	6575	7898
Cooper Power Systems	DG1M2	DG4M2
Dixie	D6575	D7888
Joslyn	J1034	J7894
Kortick	K4015	K3511
Line Hardware	GSP-1	
Utilities Service	5351	C434

bn - clamp, loop deadend

For ACSR

	3/0	2/0	1/0	2	4
ALCOA	-	413	413	412	411
Anderson/Sq. D	LC-74B	LC-71B	LC-70B1	LC-70B	LC-70B
Blackburn	DLC23	DLC2106	DLC2106	DLC2106	DLC2106
Burndy	-	-	UW25R	UW2R	UW2R
C & R	-	-	CRLD-10	CRLD-10	CRLD-10
Fargo	GA-145	GA-145	GA-144	GA-144	GA-144
Reliable/Bethea	ALD-7373-U	ALD-34-U	ALD-1313-U	ALD-1313-U	ALD-1313-U

bo - Shackle, anchor

Distribution

Manufacturer	Catalog Number 20,000 lbs. 5/8" Pin
Anderson/Sq. D	AS-25
Chance	5801
Continental	AS-25-5-4
Cooper Power Systems	DC7J1
Dixie	D5801
Flagg	12300
Joslyn	J2742
Kortick	K4481
Lapp	33852
Lindsey	3260
Line Hardware	AS-1
Reliable/Bethea	ASH-45
Sur-Loc, Inc.	5500
Utilities Service	4106

Transmission

	30,000 lbs. 3/4" bolt	50,000 lbs. 7/8" bolt
Joslyn	BT3023BNK	BT3036BNK
Flagg	13302BNK	16301FBNK

br - Chain Link (End Link)

Manufacturer	Catalog Number
Continental	L-5
Flagg	14100F
Joslyn (Brewer-Titchener)	BT-3082-HT
Lapp	6415-HT
Lindsey	3403
Reliable/Bethea	CL-5

bs - Bolt, single upset

Applicable Specifications: "RUS Specifications for Single and Double Upset Spool Bolts," D-5

Diameter, inches	5/8	5/8	5/8	5/8
Length, inches	7	8	9	10
Chance		7741	7741-1/2	7742
Cooper*		DC2E3	DC2E4	DC2E5
Dixie	D7740	D7741	D7741-1/2	D7742
Joslyn	-	J2342-1/2	J2343-1/2	J2344-1/2
Kortick	K4929	K4950	K4930	K4951
Utilities Service	3105-1/2	31053	31053A	31054

*"Static proof" designs available.

bt - Wireholder, clevis type with No. 24 wood screw

(For use with triplex type service cable, Drawing K10C-A)

Chance	0192*
Cooper Power Systems	DW5R1*
Dixie	D075*
Joslyn	J075*

*Catalog number does not include insulator. Use secondary type spool insulator with 1-3/4 inch groove diameter. See page cm-1.

bu - Connector, grounding
for transformer or other equipment

Manufacturer	Copper Alloy [1]	Plated Copper Alloy [2]	Aluminum Alloy [3]
Anderson/Square D	GTCL-23A	GTCL-23A-TP	
Blackburn	TTC-4	TTC2P	
Burndy	EQC632C	EQC632C-TN	
Dossert	TGCL8-50	TGCL8-50-SN	
Fargo	GC-207	GC-207P	GA-220
Line Hardware	TGL-110	TGL-110P	
Penn-Union		GSE-C1TN	
Tanner		GET-1-TN	

1 - For use with copper type ground wire.

2 - For use with both copper and aluminum type ground wire.

3 - For use with aluminum type ground wire.

bv - Rods, armor

(includes standard, double insulator, and tapping rods)

Aluminum or aluminum alloy rods for use on ACSR

Alcoa	Formed Type
Carolina Formed Wire	Formed Type
Dulmison	Formed Type
Florida Wire and Cable	Formed Type
Helical Line Products	Formed Type
Preformed Line Products	Formed Type

Copperweld rods for copper or CWC conductor

Helical Line Products	Formed Type
Preformed Line Products	Formed Type

Alumoweld rods for aluminum clad steel (Alumoweld) overhead ground wire

Helical Line Products	Formed Type
Preformed Line Products	Formed Type

bx - Splice, automatic

Copper	Fargo	Reliable
6	GL-111	61
4	GL-112	41
2 x 3	GL-115	-
1/10 x 7	GL-117	107
2/0 x 7	GL-118	207
3/0 x 7	GL-119	307
4/0 x 7	GL-120	407
CWC		
8A	GL-112	-
6A	GL-113	47
4A	GL-115	27
2A	GL-117	-
ACSR	GL-400 Series*	7650 Series*
Aluminum Alloy (6201 and 5005)	GL-100A Series	AL55 Series
	GL-1000A Series	-

*For use on conductors 4/0 and smaller only.

bx - Splice, automatic

Manufacturer	Conditions
DISTRIBUTION	
Blackburn	
#4, #2 ACSR or 6201 (ACSR equiv.) ATS42 1/0, 2/0 ACSR or 6201 (ACSR equiv.) ATS1020 3/0, 4/0 ACSR or 6201 (ACSR equiv.) ATS3040 266.8, 336.4 kcmil ACSR ATS266336 477 kcmil ACSR ATS397477	1. To obtain experience. 2. For use on distribution systems only.
Fargo	
AWAC 4 - 4/3 GLA-105 AWAC 2 - 4/3 GLA-110 AWAC 1/0 - 4/3 GLA-115	Same as above.
266.8 kcmil ACSR 18/1 GL-1315A 336.4 kcmil ACSR 18/1 GL-1315A 477 kcmil ACSR 18/1 GL-1325A	Same as above.
Reliable	
266.8 kcmil ACSR 18/1 7657 336.4 kcmil ACSR 18/1 7658 477 kcmil ACSR 18/1 7659	Same as above.
DISTRIBUTION AND TRANSMISSION	
Fargo	
266.8 kcmil ACSR 26/7 336.4 kcmil ACSR 26/7 477 kcmil ACSR 26/7	To obtain experience.

by - Deadend, automatic and formed Type

Conductor Size

Cu	CWC	Fargo	Reliable
-	4A	GD-515	27-SDS
-	6A	GD-513	47-SDS
-	8A	GD-512	-
2 x 3	-	GD-515	271
4	-	GD-512	41LD
6	-	GD-511	61LD

ACSR

*Blackburn	ATD Series
*Dulmison	AWDG-0805, 0990, and 1135
*Fargo	GD-400 Series
*Preformed	OG-9360 thru 9366
	#OHDE-9534 thru 9540, 4577
*Reliable	7650 Series

#May only be used with a spool insulator (Item cm) and appropriate clevis for neutral and secondary applications.

*For use on conductors 4/0 and smaller only.

Aluminum Alloy
(6201 and 5005)

Blackburn	ATD Series
Fargo	GD-A Series
Preformed	OG-9360 thru 9366
Reliable	AL Series

Conditional List
by(1)
July 1995

by - Deadends, automatic and formed type

FORMED TYPE

Manufacturer	Conditions
Carolina Formed Wire	
#4 - 6/1, 7/1 ACSR #55-0229 #2 - 6/1 ACSR #55-0290 #1/0 - 6/1 ACSR #55-0365	To obtain experience.
Preformed Line Products	
AWAC 4 - 4/3 DG-4560 AWAC 2 - 4/3 DG-4562 AWAC 1/0 - 4/3 DG-4565	To obtain experience.

AUTOMATIC TYPE

Fargo	
AWAC 4 - 4/3 GDA-235 AWAC 2 - 4/3 GDA-240 AWAC 1/0 - 4/3 GDA-245	To obtain experience.
266.8 kcmil ACSR 18/1 GD-53I5A 336.4 kcmil ACSR 18/1 GD-53I5A 477 kcmil ACSR 18/1 GD-5325A	1. To obtain experience. 2. For use on distribution lines only.
Reliable	
AWAC 4 - 4/3 5201 AWAC 2 - 4/3 5202 AWAC 1/0 - 4/3 5204	To obtain experience.
226.8 kcmil ACSR 18/1 7657 SDS 335.4 kcmil ACSR 18/1 7658 SDS 477 kcmil ACSR 18/1 7659 SDS	1. To obtain experience. 2. For use on distribution lines only.

bz - Switch, oil

12.5/7.2 kV

	Type	Description
ABB	CSL**	Single-phase, manual and remote manual or elec. control, 200 amp. Three-phase, remote manual or elec. control, 200 amp.
Cooper Power Systems	NR*	Single-phase, remote elec. control, 200 amp.
	VR*	Three-phase, remote elec. control, 400 amp.
General Electric	FKC-2	Single and three-phase, manual, 200 amp.
	FKC-2*	Single and three-phase, remote control, 200 amp.

*Control equipment should be selected in accordance with the requirements of individual installations.

**This item is also available in a special design for use in areas where corrosion is a serious problem.

bz - Switch, oil

Manufacturer	Conditions
Cooper Power Systems	
Capacitor oil switch Type TSC, 38 kV max. 100 ampere capacitor switch, 300 ampere load switch	To obtain experience.
Oil switch with125 kV BIL accessory Type NR, 15 kV, single- phase, remote electric control, 200 amp. at 75 to 100 percent power factor	1. To obtain experience. 2. For use on single- phase taps of 24.9/14.4 kV multi- grounded wye systems.
Trinetics	
Capacitor, oil switch Type CSD-95, 95 kV BIL 15 kV Max. 200amp.	To obtain experience.
Oil switch with 125 kV BIL accessory, CSD-125, 15 kV, single-phase, 200 amp	1. To obtain experience. 2. For use on single-phase taps of 24.9/14.4 kV multi-grounded wye systems.

Conditional List
bz(2)
July 1995

bz - Switch, vacuum
(For capacitor switching)

Manufacturer	Conditions
Joslyn Capacitor vacuum switch, VerSaVac, 200 Amp, 95 or 125 kV BIL, single-phase or three-phase for use on 15 kV systems	1. To obtain experience. 2. Single-phase switch rated 125 kV BIL may be used on single- phase taps of 24.9/14.4 kV multi-grounded wye systems. 3. Three-phase switch requires special mounting bracket.

cg - Switch, air, three-pole, group-operated
NEMA standard switches for station and line structures

Manufacturer	Acceptable Mounting on Structures	Tilting Ins. Type	Tilting Ins. kV	Vertical Break Type	Vertical Break kV	Side Break Type	Side Break kV	Center Break Type	Center Break kV	Double Break Type	Double Break kV
ABB	Horizontal	TTR6	15-345								
A. B. Chance	Horizontal			D6(L)	15-34.5						
	Phase over Phase			D6(L)	15-34.5						
	Vertical			D6(L)	15-34.5						
G & W Electric Co.	Horizontal			MK-40	15-69	PMB-40A	15-69	LPC	69-230		
Johnson	Horizontal			VIP	15-230	LS	15-69	M	15-230		
Joslyn (Hi-Voltage)	Horizontal			RF-2(VL)	15-230	RB-1(VL)	15-25				
	Horizontal					RB-1*	15-115				
Kearney	Horizontal	AR 60-P	15-69								
MEMCO	Horizontal	AgF	15-69	EA	15-345			EE	69-230		
	Horizontal	AgC	15-69			RI4-C	I5-46				
MORPAC (Morgan)	Horizontal			VBV (VL)	15-230			CBV	15-230		
	Vertical			VBV (VL)	15-230			CBV	15-230		
	Phase over Phase							CBV	15-25		
Royal Switchgear	Horizontal							V	15-230		
	Phase over Phase							V	15-23		

(L) Means gas or solid material full-load interrupters are accepted and available.

(VL) Means vacuum full-load interrupters are accepted and available.
*These switches may be purchased with reduced voltage vacuum interrupters and may be applied for loop sectionalizing duty when peak recovery voltage does not exceed 25 kV

NOTE: Phase-over-phase mounted switches are not acceptable above 25 kV class unless equipped with full-load interrupters. Switches of 15 kV and 25 kV classes with individual phases mounted on wood crossarms or poles must be supplied with insulated interphase and control rods.

cg - Switch, air, three-pole, group-operated
NEMA standard switches for station and line structures

Manufacturer	Acceptable Mounting on Structures	Tilting Ins. Type	Tilting Ins. kV	Vertical Break Type	Vertical Break kV	Side Break Type	Side Break kV	Center Break Type	Center Break kV	Double Break Type	Double Break kV
S & C***	Horizontal			Alduti(L)	15-34.5	Alduti(L)	15-25			Alduti(L)	34.5-46
	Phase over Phase			Alduti(L)	15-25	Alduti(L)	15-25			Alduti(L)	34.5-46
	Vertical			Alduti(L)*	15-34.5	Alduti(L)	15-25			Alduti(L)*	34.5-46
SEECO	Phase over Phase			GOABS(VL)	15-69						
Siemens-Allis	Horizontal			TA(VL)	15-69	SSB-T	15-69	CCB	115-230		
				AVB(VL)**	115-345			CBL-2	115-230		
Southern States	Horizontal			EV	15-230	57K	15-69	EC	115-230		
Turner	Phase over Phase					(1D, 2D, 3D)(VL)	15-161				
	Horizontal					1D(VL)	15-161				
	Horizontal			TH1(VL)	15-161						
USCO	Horizontal			AVR(VL)**	15-230	GSH-4(VL)	15-138	AGCH **	15-345		
	Horizontal							AGCH-V**	34.5-230		
	Phase over Phase					GSH-4(VL)	15-138	GCH	15-23		

(L) Means gas or solid material full-load interrupters are accepted and available.

(VL) Means vacuum full-load interrupters are accepted and available.

*These switches, except 34.5 kV Alduti vertical break, are available and accepted with the S & C type SMD substation fuse cutouts listed on page af-3.

** Also available in bronze in some ratings.

***Available with porcelain insulators. Available with "Cypoxy" cycloaliphatic epoxy insulators through 34.5 kV on request.

NOTE: Phase-over-phase mounted switches are not acceptable above 25 kV class unless equipped with full-load interrupters. Switches of 15 kV and 25 kV classes with individual phases mounted on wood crossarms or poles must be supplied with insulated interphase and control rods.

cg - Switch, air, three pole, group operated
(Factory Preassembled)
(FOR USE ON STEEL SUBSTATION STRUCTURES)

Manufacturer	Mounting	Vertical Type	Vertical kV	Side Break Type	Side Break kV
Chance	Vertical			D7(L)	15-27
	Horizontal			D7(L)	15-27
S & C*	Phase-over-Phase	Alduti(L) 34.5 (200 kV BIL)		Alduti(L) 34.5 (200 kV BIL)	
	Vertical	Alduti (L) 34.5 (200 kV BIL)			

(L) Means gas or solid material full-load interrupters are accepted and available.

*Available with porcelain insulators. Available with "Cypoxy" cycloaliphatic epoxy insulators through 34.5 kV on request.

cg - Switch, air, three-pole, group operated

(not Suitable for Substation Use)

Manufacturer	Acceptable Mounting	Vertical Break Type	Vertical Break kV	Side Break Type	Side Break kV	Center Break Type	Center Break kV
Chance	Horizontal			D6(L)	15-34.5		
	Phase over Phase			D6(L)	15-34.5		
	Vertical	D7(L)	15-34.5				
Kearney/KPF	Horizontal			SB_H(L)	15-35		
	Phase over Phase			SB_P(L)	15-35		
Royal Switchgear	Horizontal					V	15-23
	Phase over Phase					V	15-23

(L) Means gas or solid material full-load interrupters are accepted and available.

(VL) Means vacuum full-load interrupters are accepted and available.

NOTE: Phase-over-phase mounted switches are not acceptable above 25 kV class unless equipped with full-load interrupters. Switches of 15 kV and 25 kV classes with individual phases mounted on wood crossarms or poles must be supplied with insulated interphase and control rods.

cg - Switch, three-pole, group-operated
(Factory Preassembled)

Manufacturer	Acceptable Mounting on Structures	Vertical Break Type kV	Side Break Type kV
ABB	Horizontal (A)		SLB-3(L)15-25
Chance	Horizontal (A)		D7(L)15-27
	Phase over phase (A)		D7(L)15-27
	Vertical (A)		D7(L)15-27
	Horizontal (B)		D7(L)34.5
	Phase over phase (B)		D7(L)34.5
	Vertical (B)		D7(L)34.5
Kearney/KPF	Horizontal (A)		SB_H(L) 15-35
	Phase over phase (A)		SB_P(L) 15-35
S&C*	Horizontal (A)		Alduti(L)15-25 Alduti(L)34.5 (200 kV BIL)
	Phase over phase (A)		Alduti(L)25 Alduti(L)34.5 (200 kV BIL)
	Vertical (A)		Alduti(L)15-25 Alduti(L)34.5 (200 kV BIL)
	Phase over phase (B)	Alduti(L)34.5	Alduti(L)34.5
	Vertical (B)	Alduti(L)34.5	

(L) Means gas or solid material full-load interrupters are accepted and available.

(A) Not suitable for substation use.

(B) For station and transmission use only. The steel crossarm base must be grounded with an adequate grounding connector. 200 kV BIL only.

NOTE: Switches with factory-assembled crossarm type bases for distribution lines must have non-conducting crossarm type bases, non-conducting braces, and insulated interphase and control rods, except as otherwise noted.

*Available with porcelain insulators. Available with "Cypoxy" cycloaliphatic epoxy insulators through 34.5 kV on request.

Conditional List
cg(1)
July 1995

cg - Switch, air, three-pole, group operated

Manufacturer	Conditions
Chance Type S (L) Side-break, horizontal phase-over-phase, and vertical mounting, with non-conducting crossarm type base and insulated interphase and control rods, 15 and 25 kV.	To obtain experience.
Cleaveland/Price Type V2-C (15-69 kV) Vertical break, horizontal or vertical mounting Type RL-C (15-69 kV) Single side break, horizontal or vertical mounting	1. To obtain experience. 2. Insulated interphase and control rods required on wood distribution structures.
G & W Electric Company Type MK-40A 15 kV through 345 kV(horizontal upright mounting)	1. To obtain experience. 2. Insulated interphase and control rods required on 15 kV and 23 kV models used on wood structures. 3. Steel interphase base required when mounted as in RUS Drawing TM-3.
Type LPV, 3-pole 72.5-272 kV, 1200 amp., 1600 amp., 2000 amp., center sidebreak for horizontal mounting.	To obtain experience.

(L) Means full-load interrupter accepted and available.

(VL) Means vacuum full-load interrupters are accepted and available.

cg - Switch, air, three-pole, group-operated

Manufacturer	Conditions
PASCOR	
VBP (15 - 230 kV) VBS (69 - 230 kV) Vertical break, vertical or horizontal mounting. Phase-over-Phase mounting(VBS, 69 - 115 kV only)	1. To obtain experience. 2. Insulated interphase and control rods required on wood distribution structures.
SB (15 - 69 kV) Side break, vertical or horizontal mounting.	I. To obtain experience. 2. Insulated interphase and control rods required on wood distribution structures.
CB (15 - 115 kV) Center break, vertical or horizontal mounting.	1. To obtain experience 2. Insulated interphase and control rods required on wood distribution structures.
CBSA (69 - 138 kV) Center Break Vee, vertical, horizontal, or phase-over-phase mounting. (Also accepted as a copper switch at69 - 115 kV.)	To obtain experience.
S & C*	
Line-rupter with SF_6 interrupter. Horizontal mounted 69-230 kV Vertical mounted 69-161 kV	To obtain experience.
Omni-Rupter (L) Side-break, horizontal phase-over-phase, and vertical mounting, with non-conducting crossarm type base and insulated interphase and control rods, 15 kV and 25 kV	To obtain experience.

(L) Means full-load interrupter accepted and available.

(VL) Means vacuum full-load interrupters are accepted and available.

*Available with porcelain insulators. Available with "Cypoxy" cycloaliphatic epoxy insulators through 34.5 kV on request.

Conditional List
cg(1.2)
July 1995

cg - Switch, Air, Three-Pole, Group Operated

Manufacturer	Conditions
SEECO	
GOABS (VL) Vacuum interrupter type 115-169 kV	To obtain experience.
Siemens-Allis	
Type CBL-T, 15-69 kV, 600 and 1200 amp (center break, horizontal upright mounting)	1. To obtain experience. 2. Insulated interphase and control rods required on 15 kV and 25 kV models used on wood structures.
Southern States	
"Pole-Pak" 15-23 kV	To obtain experience.
Type ES; 15, 23 and 34.5 kV (horizontal upright models only)	1. To obtain experience. 2. For 15 kV and 23 kV distribution lines, insulated interphase and control rod spacers required. See RUS Draw ings M3-15 and VM3-16. 3. NEMA insulators and steel interphase base required for transmission line structure as in TM-3. 4. Acceptable on steel substations 15 through34.5 kV with NEMA insulators and uninsulated interphase rods.
Type 57L sidebreak, 115-161 kV,600 and 1200 amp., horizontal upright	To obtain experience.
Travis Switchgear	
MA-32512, 25 kV, 150 kV BIL, vertical break	1. To obtain experience. 2. Insulated interphase and control rods required when used on wood structures.

(L) Means full-load interrupter accepted and available.

(VL) Means vacuum full-load interrupters are accepted and available.

ci - Clevis, thimble

	Rated Strength		
Manufacturer	20,000 lbs.	40,000 lbs.	50,000 lbs.
Flagg	PA271	PA272B	

cj - Pole Ground Wire

Soft annealed iron, BB Grade, class C galvanizing
(For pole protection only)

Manufacturer	Size 1.15 Ohms/1000 ft., max.
Bethlehem Steel	3-wire, 5/16 inch
Florida Wire and Cable	3-wire, 5/16 inch
Indiana Steel and Wire	3-wire, 5/16 inch
National Strand Products	3-wire, 5/16 inch
Southwire	3-wire, 5/16 inch

Copper, soft annealed solid
ASTM Specification B3

Manufacturer
(See page av-2)

Aluminum (for above ground use only)
Three-quarter hard-drawn EC grade

Manufacturer
(See page av-1)

Aluminum Alloy (for above ground use only)

Manufacturer	Type
ACPC, Inc.	6201
Alcan Cable	6201
American Electrical	6201
Southwire	6201

Copper-Clad Steel, Annealed 40 percent Conductivity

Manufacturer	Size
Copperweld Southern*	No. 6

* Not for use on distribution when neutral is larger than #1/0 ACSR.

cj - Pole Ground Wire
Aluminum Alloy (for above ground use only)

Manufacturer	Conditions
ACPC, Inc. 8177	To obtain experience.

ck - clamp, anchor rod bonding

For Standard and Drive Type Rods

Diam. of Rod	Type of Eye	5/8"	3/4"	1"
C & R Products	Single	CRBC-1	CRBC-1	CRBC-1
	Twin	CRBC-2	CRBC-2	CRBC-2
	Triple	-	CRBC-3	CRBC-3
Chance	Single	G5060	G5060	G5060
	Twin	G5061	G5061	G5061
	Triple	-	G5063	G5063
Cooper Power Systems	Single	DA1B1	DA1B1	DA1B1
	Twin	DA2B1	DA2B1	DA2B1
Dixie	Single	D3143	D3143	D3143
	Twin	-	D3144	D3144
	Triple	-	D3145	D3145
Joslyn	Single	3230	3230	3230
	Twin	3231	3231	3231
	Triple	-	3233	3233
Kortick	Single	K3147	K3147	-
	Twin	-	K3148	K3148
	Triple	-	K3149	K3149
Utilities Service	Single	CG5060	CG5060	-
	Twin	-	CG5061	CG5061
	Triple	-	CG5063	CG5063

For Power Installed Screw Anchors

C & R Products	Single	CRBC-4	CRBC-5	-
Chance	Single	G5067	G5068	-
Joslyn	Single	J26714	J26715	-

cm - Insulator, Spool

Type:	Secondary (Wet Process)		Service: Wet Process	Service: Dry Process
Groove Diameter:	1-3/4"	3"	1-3/8"	1-3/8"
Cooper Power Systems	DE4S3	DE5S3	DE2S2	DE2S1
Hughes	2102	-	-	-
Joslyn	J151	J0101	J150	J100
Kortick	K516	K522	K513	K514
Porcelain Products (Knox)	5101	5119	5107	5207
Universal	1082	-	-	-
Utilities Service	205	31221	208	207
Victor Insulators, Inc.	2012	2026	2011	-

cp - Deadend, Compression Type

ACSR

Conductor Size	Alcoa	Anderson/Sq. D
1/0	Order by	VCD-50R
2/0	Conductor	thru
3/0	Size and	VCD-61R
4/0	Stranding	"
266.8 kcmil 18/1		VCD-80-R
336.4 kcmil 18/1		VCD-80-R
477 kcmil 18/1		VCD-812-R
266.8 kcmil 26/7	2-piece	VCD-831-1-RM
336.4 kcmil 26/7	alloy	VCD-831-1-RM
477 kcmil 26/7	compression	VCD-832-2-RM
556.5 kcmil 26/7	Type VES or	VCD-833-3-RM
795 kcmil 26/7	HES	VCD-835-4RM
954 kcmil 54/7	"	VCD-835-4RM

Conductor Size	Burndy	Fargo	Kearney
1/0	Type Y-W	SEDA-8129	104000
2/0	"	SEDA-7729	thru
3/0	"	SEDA-7829	104000-03
4/0	"	SEDA-7929	"
266.8 kcmil 18/1			
336.8 kcmil 18/1			
477 kcmil 18/1			
266.8 kcmil 26/7	Type Y-W	Uni-Grip	104000-05
336.4 kcmil 26/7	Type YTW	one die	thru
477 kcmil 26/7	"	system	104000-14
556.5 kcmil 26/7	"	Order by	"
795 kcmil 26/7	"	conductor size	
954 kcmil 54/7	"	and stranding	

NOTE: These compression deadends are acceptable when installed using tools and dies in accordance with the deadend manufacturer's recommendations.

cp - Deadend, Compression Type

ACSR
Adjustable

Fargo — Order by conductor size and stranding

Aluminum Alloy
(6201 and 5005)

Conductor Size:	4 thru 4/0
Anderson/Sq. D	Type VCD, Order by conductor size.

Copper

Conductor Size:	2 x 3	4	6
National Tel. Supply	71-258/3X	71-204-P	71-162-J

Copperweld-Copper

Conductor Size:	6A	8A
National Tel. Supply	71-6A-P	71-8A-P

NOTE: These deadends are acceptable when installed with tools and dies in accordance with the deadend manufacturer's recommendations.

cp - Deadend, compression type

Manufacturer	Conditions
Burndy	
AWAC 4-4/3 YTW7M10T	To obtain experience.
AWAC 2-4/3 YTW7M9T	
AWAC 1/0-4/3 YTW7M7T	

NOTE: These deadends are acceptable when installed with tools and dies in accordance with the deadend manufacturer's recommendations.

cq - Deadend, Secondary

(For use on secondary deadends only)

Copper
Offset Compression

Conductor Size:	4	6
National Telephone Supply	91-204-P	91-162-J

Copperweld-Copper
Offset Compression

Conductor Size:	6A	8A
National Telephone Supply	91-6A-P	91-8A-P

Copperweld-Copper
Automatic Deadend

Conductor Size:	6A	8A
Fargo	GD-113	GD-112
Reliable	47FD	

cr - Bracket, Angle Suspension

Applicable Specifications: "RUS Specification for Angle Suspension Brackets," DT-4

Manufacturer	Distribution 5/8" Diam.	Transmission 3/4" Diam.
Chance		5728
Cooper Power Systems	DC8E1	
Joslyn	J7935	J7936
Kortick	K6231	K6230
Utilities Service	545	546

cs - Bracket, Pole Top Pin

For Transmission and 24.9/14.4 kV Distribution

Applicable Specifications: "RUS Specifications for Pole Top Brackets for Channel Type Pins," D-14

Chance	2157
Cooper Power Systems	DP3A1
Joslyn	J2045
Kortick	K8130
Utilities Service	36690

ct - Plate, Double Arming

Transmission

Manufacturer	4" x 1/2" x 24"	4" x 1/4" x 17"
Chance	5844	5819
Cooper Power Systems	DP21A1	DP23A3
Dixie	D5844	D5845
Joslyn	J1600	J1607
Kortick	K1454	K1465
Line Hardware	-	DAP-17
Utilities Service	4117	-

cu - Brace, crossarm, wood

Span, inches	60	60
Drop, inches	18	30
Aluma-Form	6018	6030
Brooks	446-60-18	446-60-30
Dis-Tran	DT-60R	-
Hatheway Patterson	320-R	325-R
Hughes Brothers	2045-CC	2045-D
Joslyn	J4760	J4730
Pennington	15018	15030
Utilities Structures Eng. Inc.	CU-60-18	CU-60-30

Braces listed below have 26-inch hole spacing. They are to be used in place of the flat steel braces previously listed on page h.

Aluma-Form	AF626
Brooks	58128
Hatheway Patterson	7026
Hughes Brothers	2023
Joslyn	J5526

Brace, crossarm, fiber reinforced plastic

Continental	CRB-28
Dulmison	CAB-28
Hughes Brothers	533
Stanley Flagg	FCB26

cx - Splice, oval tube

Copper

Conductor Size:	0 x 7	2 x 3	4	6
National Tel. Supply	464	463	459	457

Copperweld-Copper

Conductor Size:	6A	8A
National Tel. Supply	460	459

cy - Splice, Compression

ACSR

Conductor Size	Alcoa	Anderson/ Sq. D	Burndy
4 6/1	2-piece	VC-36R	"Unisplice"
4 7/1	Order	VC-36R	(1-piece)
2 6/1	by	VC-36R	or Y-S
2 7/1	Conductor	VC-36R	(2-piece)
1/0	Size	VC-50R	Order by
2/0	and	VC-50R	Conductor
3/0	Stranding	VC-61R	Size and
4/0	"	VC-61R	Stranding
266.8 kcmil 18/1		VC-80-R	
336.4 kcmil 18/1		VC-80-R	
477 kcmil 18/1		VC-90-R	
266.8 kcmil 26/7	2-piece	VC-831-1-RM	2-piece
336.4 kcmil 26/7	Compression	VC-831-1-RM	Type YTS
477 kcmil 26/7	Alloy Type	VC-832-2-RM	"
556.6 kcmil 26/7	CJ	VC-833-3-RM	"
795 kcmil 26/7		VC-835-4RM	"
954 kcmil 54/7		VC-835-4RM	"

Conductor Size	Fargo	Blackburn	Kearney 2 pc.	Kearney 1 pc.
4 6/1		Type RC		OH4-61-71AS
4 7/1		1-piece		OH4-61-71AS
2 6/1		Order		OH2-61-71AS
2 7/1		by		OH2-61-71AS
1/0	TJA-8129	Conductor	OH1/0-61A	OH1/0-61AS
2/0	TJA-7729	Size	OHR2/0-61A	
3/0	TJA-7829	and	OHR3/0-61A	
4/0	TJA-7929	Stranding	HR4/0-61A	
266.8 kcmil 18/1				
336.4 kcmil 18/1				
477 kcmil 18/1				
266.8 kcmil 26/7	Uni-grip		HR-266-267A	
336.4 kcmil 26/7	one die		HR336-267A	
477 kcmil 26/7	system		HR-477-267A	
556.5 kcmil 26/7	Order by		HR-556-267A	
795 kcmil 26.7	conductor size			
954 kcmil 54/7	and stranding			

NOTE: These splices are acceptable when installed with tools and dies in accordance with the splice manufacturer's recommendations.

cy - Splice, Compression

ACSR

Conductor Size	Nat. Tel. Supply	Homac	ESP
4 6/1	"Nicopress"	"Tension	FTR-4
4 7/1	(1-pc. or 2-pc.)	splicer"	FTR-4
2 6/1	Order by Conduc-	(1-piece or	FTR-2
2 7/1	tor Size and	2-piece	FTR-2.5
1/0	Stranding	Order by	FTR-1/0
2/0	2-pc.	Conductor	FTR-2/0.5
3/0	"	Size and	FTR-3/0
4/0	"	Stranding	FTR-4/0
266.8 kcmil 26/7	"	2-pc.	
336.4 kcmil 26/7	"	"	
477 kcmil 26/7	"	"	
556.5 kcmil 26/7	"	"	
795 kcmil 26/7			
954 kcmil 54/7			

NOTE: These splices are acceptable when installed with tools and dies in accordance with the splice manufacturer's recommendations.

Splice, Compression

Copper and Copperweld-Copper

Conductor Size	Anderson/ Sq. D	Burndy	Kearney	National Tel. Supply
6 cu	VCC-28	YDS6W	OH6C	1-162/J
4 cu	VCC-28	YDS4W	OH4C	1-204/P
2 x 3 cu	-	YDS2C-3	OH2-3CX	1-258/3X
0 x 7 cu	-	YDS25	OH1-7C	1-325/7F6
8A CWC	VCC-28	YDS8KT	OHR8ACW	1-8A-P
6A CWC	VCC-28	YDS6KT	OHR6ACW	1-6A-P
4A CWC	VCC-37	YDS4KT	OHR4ACW	1-4A-X
2A CWC	VCC-43	-	-	-

Conductor Size	Homac
6 cu	J2C3
4 cu	L2C5
2 x 3 cu	S2C7
0 x 7 cu	U2C9
8A CWC	L2E1
6A CWC	L2E3
4A CWC	Q2E5
2A CWC	U2E7

NOTE: These splices are acceptable when installed with tools and dies in accordance with the splice manufacturer's recommendations.

cy - Splice, compression (one-piece)

(For 6201 and 5005 Aluminum Alloy Conductors)

Conductor Size	Anderson/ Square D	Burndy	Blackburn
#4 thru 4/0	Type VC-R Order by Conductor Size and Stranding	"Unisplice" Order by Conductor Size and Stranding	Type RC Order by Conductor Size and Stranding

Conductor Size	Homac	ESP
#4 thru 4/0	"Tension Splicer" Order by Conductor Size and Stranding	Type FTR order by size and stranding

NOTE: These splices are acceptable when installed with tools and dies in accordance with the splice manufacturer's recommendations.

cy - Splice, compression

1-piece splice for ACSR

Manufacturer	Conditions
*ALCOA "Jiffy Joint"	To obtain experience.

1-piece splice for AWAC

Burndy AWAC 4-4/3 YDS7M10T AWAC 2-4/3 YDS7M9T AWAC 1/0-4/3 YDS7M7T	To obtain experience.

*Satisfactory for use with 6201 and 5005 all aluminum alloy conductor through 4/0 and 19 strand conductors of sizes 266.8 kcmil and 477 kcmil.

NOTE: These splices are acceptable when installed using tools and dies in ccordance with the splice manufacturer's recommendations.

cz - Splice for Steel Strand (Overhead Ground Wire)

Compression

Single Sleeve Only

	High Strength Steel		Extra High Strength			Aluminum Clad Steel		
	3/8"	7/16"	5/16"	3/8"	7/16"	7 No. 9 AWG	7 No. 8 AWG	7 No. 7 AWG
Alcoa				4914.386	4916.453			
Burndy	YTS375E	YTS438E				YDS7M9T	YDS7M8T	YDS7M7T
Fargo	81I425	8II630	81I222	81I425	81I630	811425	811427	811630
Kearney	HR-3/8-3-7S							
National.Tel.Supply	5-7/12OG92	5-7/145J22						
Steel and Aluminum Sleeves								
Homac	28414 (Two piece)							
Automatic								
Reliable	5002	5043	5041	5042	5043	5042	5042	5043
Bolted Type								
Electroline	GD-537							
Formed Type								
Chance	10SS 3/8C	16SS 7/16C	6SS 5/16C	10SS 3/8C	16SS 7/16C			
Helical Line Products	HS-310-3/8"	HS-311-7/16"						

da - Bracket, insulated

	Bracket without Insulator	Bracket with 1-3/4" Spool Insulator	Bracket with 3" Spool Insulator
Chance	0327	0327-C909-1032	0327-C909-1034
Cooper	DC2C1	-	-
Dixie	D0327	-	-
Hughes Brothers	1077LI	1077SI	1077I
Joslyn	J1300	J1301	J1303
Kortick	K9278	K9081	K9082

dh - Ground, pole

(For system grounds, see ground rods on page ai.)

Manufacturer	Catalog Number
Galvanized Steel Plate With Insulated Copper Lead	
(For connecting to a copper or aluminum ground wire above ground.)	
Cooper Power Systems	DN13M1
Joslyn	J055W
Line Hardware	PGPS-56CL8
Galvanized Steel Plate with Connector	
(For connecting to a galvanized iron ground wire)	
Joslyn	J055
Line Hardware	PGPS-56C
Copper Plate	
Blackburn	GP-100
Drabco	D 101
Eritech	EGP-100
Homac	5575
Joslyn	J9196
Line Hardware	PGPC-56

dl - Pipe Spacer

3/4" diameter x 1-1/2" length

Manufacturer	Catalog Number
Chance	2237
Cooper Power Systems	DM3P2
Dixie	D2031
Joslyn	J2031
Utilities Service	36695

dm - Bracket, transformer
(For cluster mounting of two or three transformers on pole)

Manufacturer	Transformer Size, kVA	Band Type	Through Bolt Type
Aluma-Form	3-50	6M3-6	3MW-24-M
	75-100	15M3-6	11MW-24
Chance	3-50	C212-8002 C212-8003	C212-0142
	75-100	C212-8005	C212-0146
Cooper Power Systems	3-25 DT25Cl	(Use 3 no. DTl7Al Adapter Plates)	DT6Cl
	37 1/2-50	DT25C4	DT7Cl
	75-100	DT25C4	DT8Cl
Dixie	3-25		DW-50
	37-1/2-50		DW-50
	75-100		DW-167
Hughes	3-25		3021
	37-1/2-50		3020
	75-100		3020 with adapter plates and back plate.
Joslyn	3-25	24352, 24353 with adapter plate 24524	J6865
	37-1/2-50	24352, 24353 (two needed)	J6864
	75-100	24352, 24353 (two needed)	J6866
Turner	3-25		305-25
	37-1/2-50		305-100
	75-100		305-100

For mounting of two transformers

Aluma-Form	3-100	DM-4M2
	3-50	DM-2M2
Chance	3-100	C212-0001
Hughes	3-50	3022
Turner	3-50	205-25

dp - Clamp, ground wire

Transmission

For grounding steel towers and substation structures

Bolt Included

(For use with copper ground wires)

Manufacturer	Catalog Number
Penn-Union	GH-30-C-A1
Royal Switchgear	12202-T (Type LCS)
Square D	GC-143A--OZ

For use in: Pole Grounding Assembly TM-9
Capacitor Assemblies M9-11, M9-12 and M9-13

Manufacturer	For 5/8" Bolt	For 3/4" Bolt
Continental	SBL-33	-
Cooper Power Systems	DG1C5	DG1C6
Dixie	D-5452	-
Flagg (MIF)	PA-166A	-
Joslyn	J1163	J1164

dq - Eye Screw, Elliptical

For use in deadending triplex type service cable, Drawing K10C.

Manufacturer	Catalog Number
Cooper Power Systems	DF7E6
Joslyn	J8930

dr - Clevis, conduit, insulated

For use in deadending triplex service cable, Drawing K16C.

Applicable Specifications: "RUS Specifications for Insulated Conduit Clevises and Conduit Wire-holders for Pipe Mast Deadends," D-16

Cooper Power Systems	DW8M1*
Joslyn	J0311*

*Insulator not included. See page cm for spool insulator.

ds - Wireholder, conduit

For use in deadending open wire services on pipe masts, Drawing K17

Applicable Specifications: "RUS Specifications for Insulated Conduit Clevises and Conduit Wireholders," D-16

Manufacturer	Catalog Number
Chance	C207-0075
Cooper Power Systems	DW2C5
Dixie	D-4010
Joslyn	J0588

ds - Wireholder, conduit

Manufacturer	Conditions
Joslyn J0588Z (nylon alloy)	To obtain experience.

dt - Deadend, service

For deadending triplex type service cable, Drawing K10C.

Manufacturer	ACSR Size	Catalog Number: Wedge Type	Catalog Number: Formed Type
Blackburn	4	W62-1	
Carolina Formed Wire	4		54-0225
	1/0		54-0361
	2/0	-	54-0401
Dulmison	4		SG0570
	2		SG0735
	1/0		SG0915
	2/0		SG1020
Helical Line Products	4	-	HSG-514
	2	-	HSG-518
	1/0	-	HSG-522
Penn-Union	4	WDC-2S	-
Preformed Line Products	4	-	SG-4502
	2	-	SG-4504
	1/0	-	SG-4506
	2/0	-	SG-4507
	3/0	-	SG-4508
	4/0	-	SG-4509
Reliable	4	7195	-
	2	7187	-
	1/0	7287	-

du - Link, Extension

DISTRIBUTION

Manufacturer	Catalog Number
Atlas Power Products	APP-1180-H
Chance	C207-0112
Continental	CEL-14
Cooper	DC33B6
Flagg (MIF)	PA319
Reliable/Bethea	LCE-14
Utilities Service	495

TRANSMISSION
(25,000 lbs. min. strength)

Joslyn	J26082
Reliable/Bethea Products	ASM 7209-1-BC

Guy Extension Link
(For "H" Structure)

Manufacturer	One Guy Attachment	Two Guy Attachment
Joslyn	J22421	J26025

NOTE: The distribution extension links may be substituted for anchor shackle (Item bo), eye bolt (Item o) and eye nut (Item aa) for both small and large conductor drawings shown in RUS Form 803 and RUS Bulletin 50-3 at the option of the owner.

Conditional List
du(1)
July 1995

du - Connecting Links for Pole Bands

Conditions - To obtain experience in conjunction with pole bands
Item fv(1)

For Use With Medium Duty Pole Bands

Manufacturer	Link to Insulators	Size	Minimum Strength Rating
Hughes Bros.	3176	3/8"x3"x9-1/2"	25,000 lbs.
Joslyn	J26034	3/8"x3"x9-1/2"	25,000 lbs.

	Link to Guy		
Hughes Bros.	3154	3/8"x2"x9-1/2"	36,000 lbs.
Joslyn	J26035	3/8"x3"x9-1/2"	36,000 lbs.

For Use With Heavy Duty Pole bands

Manufacturer	Link to Insulators	Size	Minimum Strength Rating
Hughes Bros.	3157	3/8"x3"x12"	36,000 lbs.
Joslyn	J26035 - 2	3/8"x3"x9-1/2"	36,000 lbs.

	Link to Guy		
Hughes Bros.	3157	3/8"x3"x12"	51,000 lbs.
Joslyn	J26037	1/2"x3"x12"	51,000 lbs.

dy - Bolt, eye, double arming

Applicable Specification: ANSI C135.4, "Standards for Galvanized Ferrous Eye Bolts and Nuts for Overhead Line Construction."

Applicable Sizes : 5/8 inch, 14 through 26 inch length
3/4 inch, 14 through 26 inch length

The following manufacturers have shown compliance with the applicable specifications:

A. B. Chance Company
*Cooper Power Systems
Dixie Electrical Manufacturing Company
Joslyn Manufacturing and Supply Company
Kortick Manufacturing Company
Utilities Service Company

*"Static proof" designs available.

dz - Clip, Guy Wire

Manufacturer	5/16"	3/8"	7/16"	1/2"
Chance	6453	6454	6455	6456
Cooper Power Systems	DJ17C6	DJ17C8	DJ17C10	DJ17C12
Utilities Service	4953	4954	4955	4956

ea - Insulator and Stud, post type

DISTRIBUTION

System voltage, kV	12.5/7.2*	12.5/7.2*	24.9/14.4**
Leakage, inches	7-1/2	10	15
Flashover, dry, kV	65	70	95
Flashover, wet, kV	40	50	65
Lapp			
7" Stud	4415P	4420P	4427P
1-3/4" Stud	4315P	4320P	4327P
Newell Porcelain			
7" Stud	-	43570-7040	47101-7040
1-3/4" Stud	-	43570-7010	47101-7010
Porcelain Products (Knox)			
7" Stud	5115-6510	5120-6510	5127-6510
1-3/4" Stud	5115-6500	5120-6500	5127-6500

TRANSMISSION

System voltage, kV	22	34.5	46
ANSI Class	57-2	57-3	57-4
Flashover, dry, kV	110	125	150
Flashover, wet, kV	85	100	125
Lapp			
7" Stud	9435	9445	9455
1-3/4" Stud	9335	9345	9355
Newell Porcelain			
7" Stud	37620-7040	41640-7040	41650-7040
1-3/4" Stud	37620-7010	41640-7010	41650-7010
Porcelain Products (Knox)			
7" Stud	5135-6512	5145-6512	-
1-3/4" Stud	5135-6502	5145-6502	-

NOTE: Post Insulators (item ea) may be substituted for the crossarm pin (Item f) and pin insulator (Item a) for both small and large conductor distribution drawings shown in RUS Bulletin 50-5 (Form 803) at the option of the owner.

*The transverse loading on these insulators shall not exceed the lower of 40 percent of the insulator's ultimate strength and the maximum transverse loading given for the structure in RUS Bulletin 50-3 (Form 804).

**The transverse loading on these insulators shall not exceed 40 percent of the insulator's ultimate strength.

ea - Insulators, horizontal post type

Manufacturer	34.5 kV	69 kV	115 kV
Lapp	F-4745	F-4788	F-70147
Locke	-	LS02513	LS05013
Newell Porcelain	43740-7700	43790-7700	47043-7700
Victor Insulators, Inc.	62356	62359	-

ea - Insulator, post type

Manufacturer	Conditions
Victor Insulators, Inc. 2120 (12.5/7.2 kV) 2127 (24.9/14.4 kV) 62055 (22 kV) 62056 (34.5 kV)	To obtain experience.

eb - Bracket, Pole Top
For Post type Insulators

DISTRIBUTION

Anderson/Square D (14.4 or 7.2 kV)	84324-2000
American Connector (14.4 or 7.2 kV)	PTB-58
Chance (14.4 or 7.2 kV)	1B4
Continental (14.4 or 7.2 kV)	PTB-55-8
Cooper Power Systems (14.4 or 7.2 kV)	DC126B1
Flagg (MIF) (14.4 or 7.2 kV)	P526
Joslyn (14.4 or 7.2 kV)	J23333
Lapp (Line Ware) (14.4 or 7.2 kV)	304043
Line Hardware (14.4 or 7.2 kV)	PTIB-375A
Reliable/Bethea (14.4 or 7.2 kV)	BPT-58F
Universal Electric (14.4 or 7.2 kV)	PT-8R

TRANSMISSION

Chance	1B4
Continental	PTB-66H
Cooper Power Systems	DP29A1
Flagg (MIF)	P532
Lapp (Line Ware)	304044
Reliable/Bethea	BPT-58HF

NOTE: Pole top bracket (Item eb) and post insulator (Item ea) may be substituted for pole top pin (Item b) and pin insulator (Item a) for both small and large conductor distribution drawings shown in RUS Form 803 at the option of the owner.

ec - Bracket, Offset Neutral

Chance	C206-0004
Cooper Power Systems	DC6N1
Dixie	D-2353
Joslyn	J2352

ed - Support, overhead ground wire

Applicable Specifications: "RUS Specifications for Overhead Ground Wire Support Brackets," T-2

Pole top diameter, inches	6-8	8-10	10-12
Chance	-	5432	5433
Dixie	-	-	D7760
Hughes Brothers	-	2859-12	2859-14
Joslyn	J6393	J6394	J6395
Kortick	K3580	K3581	K3582
Utilities Service	C1238	C1239	C1240

ef - Bolt, clevis

Applicable Specifications: "RUS Specifications for Clevis Bolts," DT-7

	Dia. Inches	8"	10"	12"	14"
Chance	5/8	15808	15810	15812	15814
	3/4	15828	15830	15832	15834
Joslyn	5/8	J7808	J7810	J7812	J7814
	3/4	J7828	J7830	J7832	J7834

eg - Plate, crossarm reinforcing

TRANSMISSION

For 5-5/8" x 7-3/8" crossarm

Manufacturer	Catalog Number
Chance	4047
Hughes Brothers	1113.88
Joslyn	J22672.6
Utilities Service	3838

eh - Hook, ball

Manufacturer	Catalog Number
Anderson Elec./Square D	HB-30
Continental Electric Co.	BH-30-5
Flagg	13400
Joslyn (Brewer-Titchener)	3001-HT
Lapp	7055
Lindsey	3310
Line Hardware	BH-30
Reliable/Bethea	BH-5

ei - Clamps, suspension with socket eye

ACSR with Straight or Formed Armor Rods

	AWG			kcmil					
	1/0 & 2/0	3/0	4/0	266.8	336.4	477	556.5	795	954
				Iron or Steel Clamps					
Anderson	MS-82-S	--	MS-104-S	MS-104-S	--	--	--	--	--
Chance	FGW4S	--	--	--	--	--	--	--	--
Lapp	305743S	--	--	--	--	--	--	--	--
Reliable/Bethea	FS-83-S	--	--	--	--	--	--	--	--

ACSR with Straight or Formed Armor Rods

	AWG		kcmil					
	1/0 & 2/0	3/0 & 4/0	266.8	336.4	477	556.5	795	954
			Aluminum Alloy Clamp					
Anderson	HAS-85-S	HAS-104-S	HAS-104-S	HAS-118-S	HAS-139-S	HAS-147-S	HAS-182-S	HAS-182-S
C & R	CRSC-1S	CRSC-2S	CRSC-3S	CRSC-3S	--	--	--	--
Continental	SC-85-S	SC-105-S	SC-105-S	SC-119-S	SC-136-S	SC-149-S	SC-177-S	SC-192-S
Dulmison	--	HSU	HSU	HSU	HSU	HSU	HSU	HSU
Lapp	306029S	306030S	306030S	306031S	306032S	--	--	--
*Preformed	--	AGS	AGS	AGS	AGS	AGS	AGS	AGS
Reliable/Bethea	LS-1-S	LS-2-S	LS-2-S	LS-3-S	LS-4-S	LS-6-S	LS-7-S	LS-8-S

*Clevis type available.

ACSR

	AWG	kcmil					
	2/0 to 4/0	266.8	336.4	477	556.5	795	954
		Iron or Steel Clamps (requires armor tape or liner)					
Anderson/Square D		80445-2000	80445-2000				
		Aluminum Alloy Clamps (do not require armor tape or liner)					
Anderson/Square D	SD-57-S	SD-70-S	SD-70-S	SD-86-S	SD-86S	--	--
C & R	CR-10-60S	CR-20-60S	CR-20-60S	--	--	--	--
Lapp	305757S	305758S	305759S	305760S	--	--	--
Reliable/Bethea	ADE-21-S	ADE-22-S	ADE-23-S	ADE-24-S	ADE-24-S	ADE-2526-S	ADE-2526-S

NOTE: When used with clevis-type insulators for large conductors on distribution lines, order clamp with clevis eye.

ek - Locknuts

For Bolt Diam., in.:	3/8	1/2	5/8	3/4	7/8
		MF Type			
Chance	3510	3511	3512	3513	3514
Cooper Power Systems	DF3N1	DF3N2	DF3N4	DF3N6	DF3N8
Dixie	D3510	D3511	D3512	D3513	--
Hughes Brothers	MF30	MF50	MF60	MF70	--
Joslyn	J8581	J8582	J8583	J8584	J8584-1/2
Kortick	K1065	K1066	K1067	K1068	--
Line Hardware	SLN38	SLN50	SLN58	SLN34	SLN78
Utilities Service	4920	4921	4922	4923	4924

el - Sectionalizer

Manufacturer	Type
Cooper Power Systems	GH (with crossarm mounting bracket KA27G)

el - Sectionalizer

Manufacturer	Conditions
A. B. Chance	
Sectionalizer, single-phase Type CES 15 kV, 95 kV BIL 200 amp max. 27 kV, 125 kV BIL 200 amp max. 38 kV, 150 kV BIL 200 amp max.	To obtain experience.
Cooper Power Systems	
Sectionalizer, three-phase Type GN3	To obtain experience.
Sectionalizer with125 kV BIL accessory Type GH, 15 kV, single phase	1. To obtain experience. 2. For use on single-phase taps of 24.9/14.4 kV multi- grounded wye systems.
*Sectionalizer, three-phase Type GN3E14.4 kV, 200 amp max.	To obtain experience.
*Sectionalizer, three-phase Types GV and GVC 14.4 kV, 400 amp. max.	To obtain experience.
*Sectionalizer, three-phase Types GW and GWC 34.5 kV, 400 amp. max.	To obtain experience.
General Electric	
Sectionalizer, single-phase cutout-type - 15 kV and 25 kV Model 9F41F	To obtain experience.
Joslyn	
Sectionalizer, three-phase, 15 kV, 400 and 600 amperes 25 kV, 600 amperes Model VBM with VT or RS control	To obtain experience.

*NOTE: Ratings greater than 100 ampere for 12.5/7.2 kV application and greater than 200 ampere for 24.9/14.4 kV application are acceptable only with ground trip device.

NOTE: Cutout type sectionalizers may also be used with cutout frames listed on pages af-1 and ax-1. Consult manufacturer for application.

em - Brace, crossarm, special
(angle alley arm)

DISTRIBUTION

15" span, 14" drop; 1-1/2" x 3/16"

Cooper Power Systems	DB4L1
Dixie	D17939
Joslyn	J1415
Kortick	K1978
Utilities Service	5514

TRANSMISSION

	2'-6" span x 1'-8" drop 1-3/4" x 3/16"	3'-6" span x 2'-3" drop 1-3/4" x 3/16"
Chance	--	6999
Cooper Power Systems	DB4L3	DB4L4
Hughes Brothers	AS-2309-B	AS-2309-A
Joslyn	J1430	J1442
Kortick	K1975	K1976
Utilities Service	5509	5510

eq - Narrow Profile Brackets and Special Arm Assemblies
(See RUS Bulletin 61-12)

METAL BRACKETS

Manufacturer	Conditions
Anderson/Sq. D Standoff bracket, COB-E-180-TGL	1. To obtain experience. 2. For use only in scenic areas and locations where right-of-way is limited. 3. Not to be used where conductor galloping may be expected.
Chance Single post insulator brackets C206-0209 for 12.5/7.2 kV construction only C206-0010 for 24.9/14.4 kV construction Deadend bracket assembly, C206-0179 Deadend bracket assembly, C206-0211 for 24.9/14.4 kV construction	Same as above.
Continental Standoff bracket IACB-18-5	Same as above.
Dixie Deadend bracket assembly D21142 for 12.5/7.2 kV Deadend bracket assembly D21144 for 24.9/14.4 kV	Same as above.
Flagg (MIF) Single post insulator bracket, P542 Deadend bracket assembly, PAX188A Deadend bracket assembly, PAX188M for 24.9/14.4 kV construction Standoff bracket, PA619B	Same as above.

eq - Narrow Profile Brackets and Special Arm Assemblies
(See RUS Bulletin 61-12)

METAL BRACKETS

Manufacturer	Conditions
Joslyn Single post insulator brackets 24840.1, for 12.5/7.2 kV construction only 24840.2, for 24.9/14.4 kV construction	1. To obtain experience. 2. For use only in scenic areas and locations where right-of-way is limited. 3. Not to be used where conductor galloping may be expected.
Reliable/Bethea Single post insulator bracket, HBF-10-9-GC Standoff bracket VIB3-18-GC	Same as above.
Universal Electric Single post insulator bracket, SAB-3-18-GC	Same as above.
Western Power Products Single post insulator bracket, HDB-200-R, for 12.5/7.2 kV construction only.	Same as above.

eq - Narrow Profile Brackets and Special Arm Assemblies
(See RUS Bulletin 61-12)

FIBERGLASS REINFORCED PLASTIC
For 12.5/7.2 kV

Manufacturer	Conditions
Atlas Power Product Single phase insulator bracket APF-813	1. To obtain experience. 2. For use only in scenic areas and locations where right-of-way is limited. 3. Not to be used where conductor galloping may be expected. 4. Not to be used in contaminated atmospheres.
Chance Two-phase pin bracket C653-0638 Standoff insulator C653-0621 Deadend arm C653-1023	Same as above.
Continental Two-phase pin bracket GPB2-568M-36V Two-phase angle bracket GPB2-568M-36E Standoff insulator GPB-58M-13 Standoff insulator GPB-58M-18 Deadend arm GDEA-58-3.0-36-2E Suspension bracket GPB-58M-18E	Same as above.

eq - Narrow Profile Brackets and Special Arm Assemblies
(See RUS Bulletin 61-12)

FIBERGLASS REINFORCED PLASTIC
For 12.5/7.2 kV

Manufacturer	Conditions
Flagg (MIF)	
Two phase angle bracket 7561-336E Two phase pin bracket 7561-436 Standoff insulator 7561-012 Standoff insulator 7561-018 Suspension bracket 7561-818 Standoff bracket7561-218 Deadend arm 7554-636-4E	1. To obtain experience. 2. For use only in scenic areas and locations where right-of-way is limited. 3. Not to be used where conductor galloping may be expected. 4. Not to be used in contaminated atmospheres.
Hughes Brothers	
Two-phase angle bracket 761-36-8 Two-phase pin bracket 813-36 Standoff insulator, 560-13 Standoff insulator, 560-18 Suspension bracket, 615-18 Deadend arm, 540-36 Standoff bracket, 892-18	Same as above.
Reliable/Bethea	
Two-phase pin bracket 6742-36P Standoff insulator bracket 6745-13P Standoff insulator bracket 6745-18P	Same as above.

Conditional List
eq(3)
July 1995

eq - Narrow Profile Brackets and Special Arm Assemblies
(See RUS Bulletin 61-12)

FIBERGLASS REINFORCED PLASTIC
For 24.9/14.4 kV

Meeting No. Manufacturer	Conditions
Chance Two-phase pin bracket C653-0987 Standoff insulator C653-0988 Deadend arm C653-1024	1. To obtain experience. 2. For use only in scenic areas and locations where right-of-way is limited. 3. Not to be used where conductor galloping may be expected. 4. Not to be used in contaminated atmospheres.
Continental Two-phase pin bracket GPB2-568M-44-V-1.375 Two-phase pin bracket GPB2-558H-48-V-1.375 Standoff insulator GPB-58M-19-V-1.375 Standoff insulator GPB-58H-20-V-1.375 Standoff bracket GPB-5568M-18-GIACB Deadend arm GDEA-58-3.0-48-2E	Same as above.
Flagg (MIF) Standoff insulator 7581-120X Standoff insulator 7561-118X Two-phase pin bracket 7561-448X Standoff bracket 7561-218 Deadend arm 7554-648-4E	Same as above.

eq - Narrow Profile Brackets and Special Arm Assemblies
(See RUS Bulletin 61-12)

FIBERGLASS REINFORCED PLASTIC
For 24.9/14.4 kV

Manufacturer	Conditions
Hughes Brothers Deadend arm, 540-48 Standoff insulator, 880-20 Two-phase pin bracket, 883-48 Standoff insulator, 870-19 Two-phase pin bracket, 862-44 Standoff bracket, 892-18	1. To obtain experience. 2. For use only in scenic areas and locations where right-of-way is limited. 3. Not to be used where conductor galloping may be expected. 4. Not to be used in contaminated atmospheres.
Reliable/Bethea Standoff insulator bracket 6882-18P Standoff Insulator Bracket 6744-19P-1.375 Standoff insulator bracket 6748-20P-I.375 Two-phase pin bracket 6742-44P-I.375 Two-phase pin bracket 6747-48P-I.375	Same as above.

eq - Narrow Profile Brackets and Special Arm Assemblies
(See RUS Bulletin 61-12)

WOOD ARM ASSEMBLIES

Manufacturer	Conditions
Aluma-Form Arm assembly, 12.5/7.2 kV XA-3812 Arm assembly, 24.9/14.4 kV XA-4214	1. To obtain experience. 2. For use only in scenic areas and locations where right-of-way is limited. 3. Not to be used where conductor galloping may be expected. 4. Not to be used as deadend structures.
Hughes Brothers Deadend arm, 2890-J complete with braces and attaching hardware, fittings and bolts	1. To obtain experience. 2. For use only in scenic areas and locations right-of-way is limited. 3. Not to be used where conductor galloping may be expected.

eq - Narrow Profile Brackets and Special Arm Assemblies
(See RUS Bulletin 61-12)

COMBINATION INSULATORS AND BRACKETS

Manufacturer	Conditions
Salisbury Horizontal Post 12.5/7.2 kV, 9561 24.9/14.5 kV, 9562	1. To obtain experience. 2. For use only in scenic areas and locations where right-of-way is limited. 3. Not to be used where conductor galloping may be expected. 4. Not to be used in contaminated atmospheres.

er - Wire Guard, Plastic

See Drawing M-24

Manufacturer	Type or Catalog Number
Chance	PFG
Fargo	GM-936
Preformed Line Products (Tree Guard)	PTG

es - Splice Cover, Plastic

(For use over compression type service connections in place of tape.)

Manufacturer	Type
Anderson/Square D	Type SEC
Kearney	Type 601
Plastic Engineering & Sales Co.	Wire Splice Cover
3M	PST Series 8420
Virginia Plastics	Type VP

Splice Cover and Moisture Seal for Secondary Cable Connections (See Drawings G312 and UM5)

Manufacturer	Type
AMP	Sealing & Dielectric Compound
Plymouth/Bishop	10 Plyseal
3M	Scotch Brand #2200

Bolted Connector Cover

(For use over bolted type service connections in place of tape.)

Manufacturer	Type
Fargo	GA-9000 B Series
Anderson/Square D	PTC

eu - Extension Link
(Fiberglass)
(Distribution)

Manufacturer	Strength	Catalog Number
Anderson/Square D	10,000 lbs.	*GSB1-9
	15,000 lbs.	GSB2-12
Atlas Power Products	11,000 lbs.	APF-100 Series
	15,000 lbs.	APF-100 Series
Continental	11,000 lbs.	*GEE11-12
	15,000 lbs.	GEE15-12
Dulmison	11,000 lbs.	*HSB-1-12
	15,000 lbs.	HSB-2X-12
Flagg (MIF)	11,000 lbs.	150-12EE
	15,000 lbs.	150-12EE
K-Line	15,000 lbs.	KL Series
Reliable/Bethea	11,000 lbs.	FGS16-EE-12P
	15,000 lbs.	FGS16-EE-12P

*For use with 6" suspension insulators.

ex - Splice, formed type

Manufacturer	Conditions
<u>Preformed Line Products</u>	
Splice for ACSR	To obtain experience.
FTS full tension splice	
Splice for AWAC	For repair only.
LS-0185 for 4-4/3	To obtain experience.
LS-0188 for 2-4/3	For repair only where alumoweld strands are not broken.
LS-0191 for 1/0-4/3	

fc - Capacitors, Shunt
12470/7200 Volts

Manufacturer	Size	1 Bushing	2 Bushing	3 Bushing
ABB	100 kvar	A10009	A10010	
	150 kvar	A15009	A15010	
	200 kvar	A20009	A20010	
	300 kvar	A30009	A30010	
	400 kvar	A40009	A40010	
Cooper Power Systems	100 kvar	CEP131B6	CEP131A6	
	150 kvar	CEP132B6	CEP132A6	
	200 kvar	CEP140B6	CEP140A6	
	300 kvar	CEP160B6	CEP160A6	
General Electric Film/Foil Type	25 kvar	52L226RC	52L206RC	
	50 kvar	51L226RC	51L206RC	
	100 kvar	54L226RC	54L206RC	
	150 kvar	54L526RC	54L506RC	
	200 kvar	58L126RC	58L106RC	
	300 kvar	59L226RC	59L206RC	59L611RC

24900/14400 Volts

Manufacturer	Size	1 Bushing	2 Bushing	3 Bushing
ABB	100 kvar	A10031	A10032	
	150 kvar	A15031	A15032	
	200 kvar	A20031	A20032	
	300 kvar	A30031	A30032	
	400 kvar	A40031	A40032	
Cooper Power Systems	100 kvar	CEP138B4		
	150 kvar	CEP137B4		
	200 kvar	CEP142B4		
	300 kvar	CEP162B4		
General Electric Film/Foil Type	50 kvar	51L252RC		
	100 kvar	54L252RC		
	150 kvar	54L552RC		
	200 kvar	58L154RC		
	300 kvar	59L154RC		
	400 kvar	98L154RC		

fd - Hangers, Capacitor

Crossarm Mounting

	1 unit	2 units	3 or 4 units
ABB	85B397G01	791C644G01	791C644G02
Cooper Power Systems	CH1A1	CH2A2	CH4A1
General Electric	39F41G2	39F53	39F80G1

Pole Mounting

	Single Phase	Three Phase	
		In Line	Cluster
ABB	AL30R (3 units)	(1 units)	
	AL60R (6 units)	AL30R	(3 units)
		AL60R	(6 units)
		AL90R	(9 units)
		(3 units)	
		AL13W	(1 unit)
		AL23W	(2 units)
		AL33W	(3 units)
		AL43W	(4 units)
		AL53W	(5 units)
Aluma-Form	CR-3* thru CR-6*	CR-3/4*	3-CR-3/4*
General Electric	39F41G1 (1 unit) 39F83G1 (3 units)	39F86G1	
Joslyn	J6744, J6744A		

* Available with oil switch mounting bracket.

fg - Crossarm Saddle

(3-3/4" x 4" with 1-1/4" x 1/4" flange)

Manufacturer	Catalog Number
Lapp	10369

fi - Connectors, hot line

Over Armor Rods

Manufacturer	Catalog Number or Series (Al to Al)	Catalog Number or Series (Al to Cu)
Anderson	AC Series	AC-GP-Series
Blackburn	PGH	-
Fargo	GA-100 Series	GA-100C Series

fj - Bracket, extension

(For use in mounting oil circuit reclosers or sectionalizers)

See Drawing VM3-10A

	Through Bolt Type	Band Type
Aluma-Form	TBRSM-1, TB2M1-9*	RSM-1
Cooper Power Systems	DR2E3	
Dixie	D-2359-M	
Joslyn	J2357	

*For mounting double lug reclosers.

fk - Bracket, oil circuit recloser or sectionalizer

(For cluster mounting of three oil circuit reclosers on pole)

Aluma-Form	RSM-3, 6M3-9*
*Cooper Power Systems	DT8C1
Turner	695-3

*Suitable for 14.4 and heavy duty 7.2 kV.

fl - Rack, primary metering

(For cluster mounting of primary metering equipment on pole)

Aluma-Form	PMM Series
Turner	3CT-PT

fm - Bracket, Arrester and Pothead Extension

For Distribution Arrester and Cutout - Pole Mounting

Manufacturer		Single Phase	Three Phase
Aluma-Form		1HCA-18 Series	R3CA-48
American Connector Engineering	12.5/7.2 kV	EMB-3-12-GC	
	24.9/14.4 kV	EMB-3-18-GC	
Anderson/ Square D	12.5/7.2 kV	COB-E-120-TGL	
	24.9/14.4 kV	ACOB-E-180	
Atlas Power Products	24.9/14.4 kV	APP-2312	12.5/7.2 kV APF-3730-13
	12.5/7.2 kV	APP-577	24.9/14.4 kV APF-3740-13
Chance		C653-1038	C653-1056
Continental	12.5/7.2 kV	IACB-12-5LGE	GPB-3-0-568M-3012-CAT 12
	24.9/14.4	IACB-18-5LGE	GPB-3-0-568M-4017-CAT 12
Cooper Power Systems		DC34B3	
Dixie	12.5/7.2 kV	D-1580	D27211-G
	24.9/14.4 kV	D-1583	
Flagg (MIF)	12.5/7.2 kV	PA613B	7510-730
	24.9/14.4 kV	PA619B	7510-740-17
Hughes Brothers		892-18	670-40
Joslyn	12.5/7.2 kV	J26190	
	24.9/14.4 kV	J26191	
Line Hardware	12.5/7.2 kV	CA-12-3GL	
Reliable/ Bethea	12.5/7.2 kV	VIB3-18-R1-GC-C	
	24.9/14.4 kV	VIB3-18-GC	
Universal Electric		SAB-3-18-GC	
Utilities Service Co.			
	12.5/7.2 kV	5936D	
	24.9/14.4 kV	5952D	

For two distribution arresters in parallel or one arrester and cutout - crossarm mounted

Manufacturer	Catalog No.
Cooper Power Systems	DM23B1

For Intermediate Arrester Mounting

Manufacturer		Single Phase	Three Phase
Aluma-Form		WBMA-1	R3CSA-48
Reliable/Bethea	12.5/7.2 kV	VIB3-18-R1-GC-C	

fn - Bracket, Cutout Extension

Manufacturer		Catalog Number
Aluma-Form		1HCA-C-18
American Connector Engineering	12.5/7.2 kV	EMB-3-12-GC
	24.9/14.4 kV	EMB-3-18-GC
Anderson Elec./ Square D	12.5/7.2 kV	COB-E-120-TGL
	24.9/14.4 kV	COB-E-180-TGL
Atlas Power Products		APF-3418
Chance		C653-1038
Continental	12.5/7.2 kV	IACB-12-5-LGE
	24.9/14.4 kV	IACB-18-5-LGE
Cooper Power Systems		DC34B1
Flagg (MIF)	12.5/7.2 kV	PA613B
	24.9/14.4 kV	PA619B
Hughes Brothers		892-18
Line Hardware	12.5/7.2 kV	CA-12-3GL
Reliable/Bethea	12.5/7.2 kV	VIB3-12F-GC
	24.9/14.4 kV	VIB3-18-GC
Universal Electric		SAB-3-18-GC

fo - Bracket, Transformer Secondary, Insulated

Manufacturer	Bracket Without Insulator	Bracket With 2-1/4" Diameter Spool Insulator	Bracket With 3-1/8" Diameter Spool
Chance	-	9113S	9114S
Cooper Power Systems	DT4M1	DT4M13	DT4M11
Joslyn	-	J6765-A	J6765
Utilities Service	865	865/208	865/205

fp - Oval Eye Ball
(30,000 lbs; to be used with 52-3 and 52-5 insulators)

Manufacturer	No.
Flagg	13000
Joslyn	BTJ 3014

fq - Laminated Upswept Arms

Applicable Specification: RUS Specification DT-5B
Applicable Drawing: RUS Drawing TUS-1

Manufacturer	Conditions
Hughes Brothers Types: C-4080A (5-1/8" width) C-4080B (5-1/8" width) C-4113A (3-1/8" width) C-4113B (3-1/8" width)	1. To obtain experience. 2. For use only in scenic and urban areas where right- of-way is limited.

fr - Triplex Cable support Clamp
(See Drawing M24)

Manufacturer	Catalog Number
Flagg	PA392

fs - Pole Bearing Plate

Manufacturer	Conditions
Continental PB-80-7	1. To obtain service and operating experience on cross- braced transmission structures. 2. For determining corrosion resistance. 3. For determining structure uplift capability of the pole under various soil and moisture conditions.
Dixie D-6370-GR	Same as above.
Flagg (MIF) P325B	Same as above.
Reliable/Bethea PBP-156-7	Same as above.

ft - Y-Clevis Ball

Manufacturer	Catalog Number
Joslyn	BT 3030
Flagg	13202F

fu - Swinging angle bracket

(TRANSMISSION)

Applicable Specification: T-8

Swinging angle bracket with hardware and fittings

Manufacturer	2' - 0"	3' - 6"	Type #1	Type #2
Brooks	64233A	64233B	X	
Hughes Brothers	2848	2848	X	X

fv - Guying Attachments
Transmission

Pole Eye Plates*
25,000 lbs. @ 90°/36,000 lbs. @ 45°

Manufacturer	Single Eye 3/4" Bolts	Single Eye 7/8" Bolts	Double Eye 7/8" Bolts
Continental	EPR-66S-12		
Flagg (MIF)	PX37D		PX42

*Capacity of pole eye plate

fv - Guy Attachments, Pole Bands Attachments, Pole Bands With Through Bolts for Transmission Lines

Medium Duty Pole Bands

25,000 lbs @ 90°/36,000 lbs @ 45°*

Manufacturer	Pole Band and Associated Hardware**	Conditions
Hughes Bros.	3108.x-2718.55	To obtain experience.
Joslyn	J25968. x GL	To obtain experience.

Heavy Duty Pole Bands

36,000 lbs. @90° /51,000 lbs. @ 45°*

Manufacturer	Pole Band and Associated Hardware**	Conditions
Hughes Bros.	3107.x-2718.55	To obtain experience.
Joslyn	J25988. x GL	To obtain experience.

* For a guy lead greater than 1/1, capacity of pole band should be derated.

** Associated hardware includes through bolt, band connecting bolts, nuts, grounding clip and lag screws (if any). Connecting links (Item du (1)) of the required strength should be ordered separately from the same manufacturers.

ga - Watthour and Watthour-Demand Meters
1ø, 2 and 3 wire or 2/3 wire 120/240 volts

(Classes 100, 200, 10, and 20)

Self-Contained Types

Manufacturer	Type of Base	Watthour Meter Type	Mechanical Demand Watthour Type	Thermal Demand Watthour Type	Number of Terminals
1	2	3	4	5	6
ABB	Bottom Con.	-	-	-	-
	Socket	AB1	-	-	4
General Electric	Bottom Con.	I50A	IM50A	-	4
	Socket	I70S	IM70S	-	4
Landis & Gyr	Bottom Con.	-	-	-	-
	Socket	MS	BMS-2S	TMS	4
Schlumberger	Bottom Con.	J5SA	J5DSA	-	-
	Socket	J5S*	J5DS	-	4

Transformer Rated Types

ABB	Bottom Con.	-	-	-	-
	Socket	AB1	-	-	5 or 6
General Electric	Bottom Con.	I50A	IM50A	-	5 or 6
	Socket	I70S	IM70S	-	5 or 6
Landis & Gyr	Bottom Con.	-	-	-	-
	Socket	MS	BMS	TMS	5 or 6
Schlumberger	Bottom Con.	J5SA	J5DSA	-	-
	Socket	J5S	J5DS	-	5 or 6

* Type J4ES for Class 320

ga - Watthour and Watthour-Demand Meters

Polyphase 2 element - 3 wire, 240 volts - Delta and 120/208 Volts Network

(Classes 100, 200, 10, and 20)

Self-Contained Types

Manufacturer	Type of Base	Watthour Meter Type	Mechanical Demand Watthour Type	Thermal Demand Watthour Type	Number of Terminals
1	2	3	4	5	6
ABB	Bottom Con.	-	-	-	-
	Socket	ABS-5	-	-	-
General Electric	Bottom Con.	V62A	VM62A	-	5
	Socket	V62S	VM62S	-	-
Landis & Gyr	Bottom Con.	-	-	-	-
	Socket	MT012S or 13S	BMT-12S or 13S	TMT-12S	5 or 8
Schlumberger	Bottom Con.	SL2A	SL2DA	-	5 or 8
	Socket	SL2S	SL2DS	-	-
		SL12S	SL12DS		

Transformer Rated Types

ABB	Bottom Con.	ABA-2	-	-	-
	Socket	ABS-2	-	-	8
General Electric	Bottom Con.	V63A	VM63A	-	8
	Socket	V63S	VM63S	-	-
Landis & Gyr	Bottom Con.	MT-5A	BMT-5A	TMT-5A	8
	Socket	MT-5S	BMT-5S	TMT-5S	8
Schlumberger	Bottom Con.	SL3A	SL3DA	-	-
	Socket	SL3S	SL4DS	-	8

ga - Watthour and Watthour-Demand Meters
Polyphase 2 element - 4 wire Delta - 120/240 volts

(Classes 100 or 200)

Self-Contained Types

Manufacturer	Type of Base	Watthour Meter Type	Mechanical Demand Watthour Type	Thermal Demand Watthour Type	Number of Terminals
1	2	3	4	5	6
ABB	Bottom Con.	ABA-7	-	-	7 or 8
	Socket	ABS-7	-	-	-
General Electric	Bottom Con.	V66A	VM66A	-	7
	Socket	V66S	VM66S	-	-
Landis & Gyr	Bottom Con.	-	-	-	-
	Socket	MT-15S	BMT-15S	TMT-15S	7
Schlumberger	Bottom Con.	SL6A	SL6DA	-	-
	Socket	SL6S	SL6DS	-	7 or 8

ga - Watthour and Watthour-Demand Meters

Polyphase - 2-1/2 element - 4 wire wye - (120/208) (277/480) volt

(Classes.100, 200, 10, and 20)

Self-Contained Types

Manufacturer	Type of Base	Watthour Meter Type	Mechanical Demand Watthour Type	Thermal Demand Watthour Type	Number of Terminals
1	2	3	4	5	6
ABB	Bottom Con.	ABA-8	-	-	-
	Socket	ABS-8	-	-	-
General Electric	Bottom Con.	V65A	VM65A	-	7
	Socket	V65S	VM65S	-	-
Landis & Gyr	Bottom Con.	-	-	-	-
	Socket	MT-14S	BMT-14S	TMT-14S	7
Schlumberger	Bottom Con.	SL5A	SL5DA	-	-
	Socket	SL5S	SL5DS	-	7 or 8
Transformer Rated Types					
ABB	Bottom Con.	ABA-8	-	-	-
	Socket	ABS-8	-	-	13
General Electric	Bottom Con.	V65A	VM65A	-	7 or 13
	Socket	V65S	VM65S	-	-
Landis & Gyr	Bottom Con.	MT-6A	BMT-6A	TMT-6A	10
	Socket	MT-7S or 6S	BMT-7S or 6S	TMT-7S or 6S	7 or 13
Schlumberger	Bottom Con.	SL5A	SL5DA	-	-
	Socket	SL5S	SL5DS	-	13

ga - Watthour and watthour-Demand Meters

Polyphase - 3 element - 4 wire wye - (120/208) (277/480) volt

(Classes 100, 200, 10, and 20)

Self-Contained Types

Manufacturer	Type of Base	Watthour Meter Type	Mechanical Demand Watthour Type	Thermal Demand Watthour Type	Number of Terminals
1	2	3	4	5	6
ABB	Bottom Con.	ABA-3	-	-	-
	Socket	ABS-3	-	-	7 or 8
General Electric	Bottom Con.	V64A	VM64A	-	-
	Socket	V64S	VM64S	-	7 or 8
Landis & Gyr	Bottom Con.	-	-	-	-
	Socket	MT-16S	BMT-16S	-	7
Sangamo	Bottom Con.	S4A	S4DA	-	-
	Socket	S4S	S4DS	-	7 or 8
Transformer Rated Types					
ABB	Bottom Con.	ABA-3	-	-	-
	Socket	ABS-3	-	-	-
General Electric	Bottom Con.	V64A	VM64A	-	-
	Socket	V64S	VM64S	-	13
Landis & Gyr	Bottom Con.	MT-9A	BMT-9A	-	12
	Socket	MT-9S or 10S	BMT-9S or 10S	-	13
Sangamo	Bottom Con.	SL4A	SL4DA	-	-
	Socket	SL4S	SL4DS	-	13

ga - Meters, Min/Max Indicating

Ammeters Indicating

Manufacturer	Type	Description
Biddle	50,000 Series	Thermal, Max Pointer
Demico	AD121R	Digital min/max ampere demand meter
ED Electric	Max-I-Meter (all models)	Thermal Ammeter
Schlumberger	ADS	Thermal Ammeter

Voltmeter, Min/Max

Manufacturer	Type	Description
Appalachian Electronic Instruments	LVM-100	Digital min/max averaging voltmeter
Demico	AV121R	Digital min/max voltmeter
Bitronics	VMAMC1	Digital Demand min/max voltmeter

ga - Watthour and Watthour-Demand Meters

Manufacturer	Conditions
Landis & Gyr	
Special base, 3 wire, 1 ø watthour meter, Type MS-K, Class 400 watthour and mechanical demand Type BMS-K watthour and thermal demand Type TMS-2K	1. To obtain experience. 2. To be used only where Class 400 meters are permitted by local regulatory bodies.
Socket base, 3 wire, 1 ø watthour meter, Type MS-E, Class 300	1. To obtain experience. 2. To be used only where Class 300 meters are permitted by local regulatory bodies.

ga - Watthour and Watthour-Demand Meters
Solid State Registers

Manufacturer	Conditions
ABB	
Solid State Polyphase Watthour meter, Alpha line, A1, A and S type bases (all forms) Class 20 and 200, 120, 240, 277, and 480 V	To obtain experience.
Landis & Gyr	
Solid State Watthour Meter Type DDS2, Form 5S, 6S, 8S, 9S, 10S, Class 20.	To obtain experience.
Schlumberger	
FULCRUM SQ400 Form 5A, 6A, 9A, 5S, 6S, 9S, 10S, Class 20 FULCRUM SL300 Series Form 5A, 6A, 8A, 9A, 5S, 6S, 8S, 9S, 10S, 12S, 14S, 15S, 16S, Class 20 and 200. VECTRON Form 5A, 6A, 9A, 10A, 5S, 6S, 8S, 9S, 12S, 14S, 15S, 16S, Class 20 and 200. QUANTUM Q200 Series Form 5A, 6A, 8A, 9A, 5S, 6S, 8S, 9S, 10S, 26S, Class 20 and 200. QUANTUM Q300 Series Form 6A, 9A, 6S, 9S, 10S, Class 10 and 20.	To obtain experience.

gb - Meter Sockets

Manufacturer	Type or Catalog Number: Ring	Type or Catalog Number: Ringless	No. Jaws	Rating Amps.
ABB	#S		4, 5, 6	100
	STS		5, 6	200/400** 1ø 3w
	STS-2		8	200/400** 3ø 3w
	STS-3		13	200/400** 3ø 4w Y or Delta
	STS-7		8	200/400** 3ø 4w Delta
	STS-8		8 or 13	200/400** 3ø 4w Y
		STA-2		200/400 3ø 3w
		STA-3		200/400 3ø 4W Y or Delta
		STA-7		200/400 3ø 4w Delta
		STA		200/400 1ø 3w
Anchor#	1000 Series (1003-1006)	1000 Series (1003-1006)	4, 5	100
	1100 Series (1100-1109)	1100 Series (1100-1109)	4, 5, 7	150
	1200 Series (1201-1209)	1200 Series (1201-1209)	4, 5	200
		1200/1300 Series (1275-1300)	4, 5, 7	200
	1600 Series (1600-1661)	1600 Series (1600-1661)	4, 5	320
	1500 Series (1500-1526)	1500 Series (1500-1526)	4, 5	100/125 per sta.
	1500 Series (1530-1536)	1500 Series (1530-1536)	4, 5	150 per sta.
	1500 Series (1540-1546)	1500 Series (1540-1546)	4, 5	200 per sta.
	1400 Series (1405-1473)	1400 Series (1405-1473)	4, 5, 6, 7, 8, 13	20/100
Murray	SJ Series* (Single)	RJ Series* (Single)	4, 5, 6	100
	SN Series* (Single)	RN Series* (Single)	4, 5, 6	100
	SS Series* (Single)	RS Series* (Single)	4, 5, 6	200
		RH Series* (Single)	5, 7	200 HD

#Available with UL label
*UL label

gb - Meter Sockets

Manufacturer	Type or Catalog Number: Ring	Type or Catalog Number: Ringless	No. Jaws	Rating Amps.
Durham	R-RS512	RS502#	4 or 5	150
	R-RS502		RS512#	
		H-4300 Series#	4, 5, 7	320
		H-5300 Series#		
		H-7300 Series#		
	RS101-RS111#	RS101-RS111#	4 or 5	100
	2R1121-6R1131#	2R1121-6R1131#		
	2R1421-6R1431#	2R1421-6R1431#		
	RS202#	RS202#	4 or 5	200
	RS212, RS213#	RS212, RS213#	4 or 5	200
	RS220-RS233#	RS220-RS233#		
	2R2332-6R2392#	2R2332-6R2392#		
Dyna-Tech	Overhead			
	1100-C - 1107-C	1000-C - 1007-C	4 & 5	100
	1300-C - 1307-C	1200-C - 1207-C	4 & 5	100
	2100-CH-2107-CH	2000-CH-2007-CH	4 & 5	200
	2300-CH-2307-CH	2200-CH-2207-CH	4 & 5	200
	Underground			
		2590-CHU-2597-CHU	4 & 5	200
		2790-CHU-2797-CHU	4 & 5	200
		2090-CHU-2097-CHU	4 & 5	200
		2290-CHU-2297-CHU	4 & 5	200
General Electric	R-2#		4, 5, 6	100
		?????????	4, 5, 6	100
		SI-73#	4, 5, 6	200
		SI-73# for ?????????	4, 5, 6	200
	Underground			
		SV-60#	7, 8, 13	100-200, 20
		SI-60#	4, 5, 6	100
		SI-60	5, 6	20
General Switch	42100 Series*		4, 5, 6	100

*UL Label
#Available with UL label

gb - Meter Sockets

Manufacturer	Type or Catalog Number: Ring	Type or Catalog Number: Ringless	No. Jaws	Rating Amps.
Landis & Gyr	Overhead			
	AS Series	AS Series	4, 5, 6	100-200
		A2 thru A6	4, 5	100-200
		Series (Multiple Mounting)		
		CQ#	4, 5, 7	200
		HQ#	4, 5, 7	200 HD
		HQ-T	6, 7, 8, 13	20
	Underground			
		RSU#	4, 5, 6	200
		CQ-U#	4, 5, 7	200
		HQ-U#	4, 5, 7	200
Milbank	Overhead			
		S7462, 3,4,5,6		
		U7362*, 3,4,5,6	4 or 5	100
	S7486 Series	R7486 Series*	4 or 5	100
	S7262 Series	U7262 Series*	4 or 5	150
	S7021 Series	U7021 Series*	4 or 5	200
	S9550 Series	U9550 Series*	4 or 5	200 (HD)
	S9700 Series	U9700 Series*	7	200 (HD)
	Underground			
	S8086-XL	U8086-XL*	4 or 5	100
	S8084-XL	U8084-XL*	4 or 5	150
	S7040-XL	U7040-XL*	4 or 5	200
	S9551-XL	U9551-XL*	4 or 5	200 (HD)
	S9701-XL	U9701-XL*	7	200 (HD)

Available with UL label
*UL label

Manufacturer	Type or Catalog Number: Ring	Type or Catalog Number: Ringless	No. Jaws	Rating Amps.
	Overhead			
Superior		501	4, 5	100
	314*	414*	4, 5	150
	314*	414*	4, 5	200
		452 Series	4, 5	150 per sta.
	382 Series	482 Series*	4, 5	200 per sta.
		492 Series	7	200 3ø 4w Y or Delta per sta.
		RLK Series*	5, 7	200 3ø 4W Y or Delta 600 V
	Underground			
Superior	314*	414*	4, 5	100
		414*	4, 5	150
		414	7	200 3ø 4w Y or Delta
		"RLPK" Series	5, 7	200 3ø 4w Y or Delta 600 V
		BRL 1915	4, 5	150 per sta.

#Available with UL label
* UL label
** Transformer rating in first figure; maximum loading shown by second figure

Conditional List
gb(1)
July 1995

gb - Meter sockets

Manufacturer	Conditions
Durham	
M-400 ampere 4 or 5 jaws for use with Class 10 meters	To obtain experience.
Landis & Gyr	
Meter mounting device 400 ampere, Type K-4# for use with Type MS-K, 1 ø Duncan meters	1. To obtain experience. 2. To be used only where Class 400 meters are permitted by local regulatory bodies.
Socket type HQ-4S 4 jaws rated for Class 300 service	1. To obtain experience. 2. To be used only where Class 300 meters are permitted by regulatory bodies.
Milbank	
Type S1079-F, 4 jaws rated for Class 320 service	To obtain experience.

#Available with UL label.

gj - Crossarm Assemblies and Arm Spacers

Distribution

Wood crossarm assembly complete with braces
and attaching hardware, fittings and bolts

Crossarm Assembly

Manufacturer	Crossarm Size	Catalog No.
Brooks	3-1/2" x 4-1/2" x 8'-0"	3103-A8
	3-3/4" x 5-3/4" x 8'-0"	3103-C8
	3-3/4" x 7-3/4" x 8'-0"	3203-A8
	3-3/4" x 7-3/4" x 10'-0"	3203-A10
Hughes Brothers	3-1/2" x 4-1/2" x 8'-0"	2890A
	3-3/4" x 5-3/4" x 8'-0"	2890B
	3-3/4" x 7-3/4" x 8'-0"	2892-A
	3-3/4" x 7-3/4" x 10'-0"	2892-B
Pennington	3-1/2" x 4-1/2" x 8'-0"	C500B
	3-3/4" x 5-3/4" x 8'-0"	C500F
	3-3/4" x 7-3/4" x 8'-0"	C500M

Twin Arm Spacer*

To be used with standard hardware, 3-5/8" x 4-5/8" x 8'-0" crossarm, and 28" wood braces

Flagg	PX240
Line Hardware	CAS-455

*Restricted to applications where the conductor's maximum design tension is less than 1250 lbs. and to conductor sizes 1/0 ACSR and below.

Conditional List
gj(1)
July 1995

gj - Crossarm Assemblies

Braceless

Manufacturer	Conditions
Aluma-Form	
HD-DEA-86-EB-REA	To obtain experience.
HD-DEA-108-EB-REA	
HD-2-DEA-108-EB-REA	
Hughes Brothers	
3377-A7.5	To obtain experience.
3377-A8.5	
3377-A9.5	

gw - Crossarm Assembly for H-Frame Construction

Applicable Specification: RUS Specification T-7, Revision dated November 1962
Applicable Drawing: TH-11B Series (161 kV maximum)
No braces (TH-11B)
Two vee braces on outside (TH-11BVO)
Two vee braces on inside (TH-11BVI)
Four vee braces (TH-11BV4)

3-5/8" x 9-3/8" x 33' wood crossarm assembly complete with attaching hardware, fittings, bolts and 3-3/8" x 5-3/8" braces.

Catalog Nos. or Drawing Nos.

	TH-11B	TH-11BVO	TH-11BVI	TH-11BV4
	Items	Items	Items	Items
(Assemblies)	gw	gw and vo	gw and vi	gw and vv
Brooks (1,2)	6411	6411-1	6411-2	6411-3
Hughes Bros.(1,2)	C3316-B	C3316-B	C3316-B	C3316-B
Pennington (1,2)	CCC11B72	CCC11B72-VO	CCC11B72-VI	CCC11B72-V4

1 - Fixed spacer fitting sizes as required
2 - Adjustable spacers are available

gw - Crossarm Assembly for H-Frame construction
(Double Arm) 230 kV (Small Angle)

Applicable Specification: RUS Specification T-8
Drawing: TH-231B

Assembly complete with attaching hardware, fittings, bolts and braces.

Crossarm 3-5/8" x 9-3/8"

Manufacturer	Catalog Number
Brooks (1, 2)	64231
Hughes Brothers (1, 2)	C-3338-B
Pennington (1, 2)	CCC231B82

Crossarm 5-1/8" x 7-1/2"

Brooks (1, 2)	64231L
Hughes Brothers (1, 2)	C-3338-BL
Pennington (1, 2)	CCC231BT

1 - Fixed spacer fitting sizes as required.
2 - Adjustable spacers are available.

gx - Single Pole Steel Structures with Arms

Applicable Specification: RUS Specification for Single Pole Steel Structures Complete with Arms, T-9

<u>Manufacturer</u>

FL Meyer Industries

Muskogee Iron Works

Power Enterprises, Inc.

Summit Manufacturing Company

TransAmerican Power Products, Inc.

Union Metal

Valmont Industries, Inc.

gy - Crossarm Assembly for H-Frame Construction (Double Arm)

Applicable Specification: RUS Specification T-7, Revision dated November 29, 1962

Applicable Drawing: TH-10 Series
No braces (TH-10)
Two vee braces on outside (TH-10VO)
Two vee braces on inside (TH-10VI)
Four vee braces (TH-10V4)

3-5/8" x 9-3/8" x 32' wood crossarm assembly complete with attaching hardware, fittings, bolts and 3-3/8" x 5-3/8" braces.

Catalog Nos. or Drawing Nos.

	TH-10	TH-10VO	TH-10VI	TH-10V4
	Items	Items	Items	Items
(Assemblies)	gy	gy and vo	gy and vi	gy and vv
Brooks (1,2)	6410	6410-1	6410-2	6410-3
Hughes Bros. (1,2)	C-3316-A	C3316-A	C-3316-A	C-3316-A
Pennington (1,2)	CCC1071	CCC1071-VO	CCC1071-VI	CCC1071-V4
Niedermeyer-Martin (1)	N-6710	N-6711	N-6712	N-6713

1 - Fixed spacer fitting sizes as required

2 - Adjustable spacers are available

gy - Crossarm Assembly for H-Frame Construction (Double Arm) 230 kV (Tangent)

Applicable Specification: RUS Specification T-8

Applicable Drawing: TH-230

Assembly complete with attaching hardware, fittings, bolts and braces.

Crossarm 3-5/8" x 9-3/8"

Manufacturer	Catalog No.
Brooks (1, 2)	64230
Hughes Brothers (1, 2)	C-3338-A
Pennington (1, 2)	CCC23081
Niedermeyer-Martin (1)	N-6720

Crossarm 5-1/8" x 7-1/2"

Brooks (1, 2)	64230L
Hughes Brothers (1, 2)	C-3338-AL
Pennington (1, 2)	CCC230T

1 - Fixed spacer fitting sizes as required.

2 - Adjustable spacers are available.

gz - Crossarm Assembly for Wishbone Construction "Z" Type (Single Arm)

Applicable Specification: RUS Specification T-5

Applicable Drawings: RUS Drawing TSZ-1

3-5/8' x 5-5/8" wood crossarm assembly complete with brace and attaching hardware, fittings, and bolts

The following manufacturers have shown compliance with the applicable specifications for this assembly:

Manufacturer	Catalog Nos. or Drawing Nos.
Brooks	64Z1
Hughes Brothers	C-3162-A and C-3162.10

gz - Crossarm Assembly for Wishbone Construction, "Z" Type (Double Arm)

Applicable Specification: RUS Specification T-5

Applicable Drawings: RUS Drawings TSZ-2,

3-5/8" x 5-5/8" wood crossarm assembly complete with brace and attaching hardware, fittings and bolts

The following manufacturers have shown compliance with the applicable specifications for this assembly:

Manufacturer	Catalog Nos. or Drawing Nos.
Brooks (2)	64Z2
Hughes Brothers	C-3162-B and C-3162.10

(2) Adjustable spacers are available.

sb - Switch, disconnect (single-pole, hook operated station class)

NEMA standard switches for station or line structure use where single-pole switching is permissible

Manufacturer	Type	Voltage Ratings	System Voltages Line to Line
ABB	HPL	15 thru 69 kV	12.5 thru 69 kV
Bridges	EH	15 thru 69 kV	12.5 thru 69 kV
	EHL(L)	15 thru 34.5 kV	12.5 thru 34.5 kV
Chance	M3(PL)	15 thru 27 kV	12.5 thru 24.9 kV
Cleaveland/Price	LCO-C	15 thru 69 kV	12.5 thru 69 kV
Cooper Power Systems	D2(PL)	15 and 23 kV	12.5 thru 24.9 kV
G & W Electric	B-2M	15 thru 69 kV	12.5 thru 69 kV
	EV(PL)	15 thru 34.5 kV	12.5 thru 34.5 kV
Hi-Voltage	HU	15 thru 34.5 kV	12.5 thru 34.5 kV
(Joslyn)	HI	15 thru 34.5 kV	12.5 thru 34.5 kV
Johnson	HPT	15 thru 69 kV	12.5 thru 69 kV
Kearney	M-72(PL)	15 thru 69 kV	12.5 thru 69 kV
	H-72	15 thru 34.5 kV	12.5 thru 34.5 kV
MEMCO	STV	15 thru 69 kV	12.5 thru 69 kV
	STU	15 thru 69 kV	12.5 thru 69 kV
Morgan	DHS(PL)	15 thru 69 kV	12.5 thru 69 kV
Royal	BT	15 thru 69 kV	12.5 thru 69 kV
Switchgear	BLT(PL)	15 and 23 kV	12.5 thru 24.9 kV
S & C*	LBD(PL)	15 thru 34.5 kV	12.5 thru 34.5 kV
	Alduti (L)	15 and 25 kV	12.5 thru 24.9 kV

(L) Means solid material load interrupters are available and accepted.

(LV) Means vacuum interrupters are available and accepted.

(PL) Means hooks for portable load interrupters are available for voltages 34.5 kV and below. Consult switch manufacturer concerning loop switching applications at higher voltages.

*Available with porcelain insulators. Available with "Cypoxy" cycloaliphatic epoxy insulators through 34.5 kV on request.

sb - Switch, disconnect (single-pole, hook-operated station class)

NEMA standard switches for station or line structure use where single-pole switching is permissible

Manufacturer	Type	Voltage Ratings	System Voltages Line-to-Line
Seeco	BT	34.5 thru 69 kV	34.5 thru 69 kV
Siemens-Allis	HA	15 thru 69 kV	12.5 thru 69 kV
	HS(PL)	15 and 25 kV	12.5 thru 24.9 kV
Southern States	PBO	15 thru 69 kV	12.5 thru 69 kV
	*PBN	15 thru 23 kV	12.5, 13.2, 24.9 kV
USCO	HH(PL)	15 thru 69 kV	12.5 thru 69 kV

(L) Means solid material load interrupters are available and accepted.

(LV) Means vacuum interrupters are available and accepted.

* With steel base only.

(PL) Means hooks for portable load interrupters are available for voltages 34.5 kV and below. Consult switch manufacturer concerning loop switching applications at higher voltages.

sb - Switch, disconnect (single-pole, hook operated distribution class)*

For distribution line use where power class insulation is not required and single-phase switching is permissible.

(Not suitable for substation use)

Manufacturer	Type	Voltage Rating	System Voltage Line-to-Line
Chance	M3(PL)	15 and 27 kV	12.5 thru 24.9 kV
Cooper Power Systems	D2(PL)	15 and 25 kV	12.5, 13.2, 24.9 kV
G & W Electric Company	EV(PL)	15 kV	12.5 kV
Kearney	D-73(PL)	15 and 25 kV	12.5, 13.2, 24.9 kV
Morgan	DHS(PL)	15 and 23 kV	12.5, 13.2, 24.9 kV
Royal Switchgear	BLT-F(PL)	15 and 23 kV	12.5, 13.2, 24.9 kV
S & C**	LBD(PL)	15 and 25 kV	12.5, 13.2, 24.9 kV
Siemens-Allis	HD(PL)	15 and 25 kV	12.5 thru 24.9 kV

NOTE: Switches on this page must be furnished with four bolts for double crossarm mounting.

(L) Means solid material load interrupters are available and accepted.

(PL) Means hooks for portable load interrupters are available.

(LV) Means vacuum interrupters are available and accepted.

*Steel bases only.

**Available with porcelain insulators. Available with "Cypoxy" cycloaliphatic epoxy insulators through 34.5 kV on request.

sb - Switch, hookstick
(line tension switches)

for use on 12.5/7.2 kV systems only

Manufacturer	Conditions
Bridges 127	To obtain experience.
Chance ALTD06200R	To obtain experience.
Royal Switchgear IL6B-H (available with silicone polymer insulators as catalog number IL6NP)	To obtain experience.

NOTE: All switches listed on this page have hooks for portable load interrupters.

sc - Regulators, Voltage
12.5/7.2 kV
13.2/7.62 kV

Applicable Specification: "RUS Specification for Substation Regulators," S-2.

Type	Size	Description
	ABB	
UTS, UTT	167-1000 kVA	(S) Three phase step type
	Cooper Power Systems	
VR-32	19.1 - 833 kVA	(SL) Single phase - step type
AB	50 amp.	(L) Single-phase - step type (Auto-Booster)
	General Electric	
VR-1	38.1 - 509 kVA	(SL) Single-phase - step type
MLT	500 - 1000 kVA	(S) Three-phase - step type
VML-32	500 - 833 kVA	(S) Single-phase - Vacuum step type
VMLT-32	1200 - 2800 kVA	(S) Three-phase - vacuum step type
	Siemens-Allis	
JFR	38.1 - 667 kVA	(SL) Single-phase - step type

(L) Indicates line use
(S) Indicates substation use

sc - Regulators, Voltage
24.9/14.4 kV

Type	Size	Description
		Cooper Power Systems
VR-32	72 - 833 kVA	(SL) Single phase - step type
AB	50 amp.	(L) Single phase - step type (Auto-Booster)
		General Electric
VR-1	72 - 576 kVA	(SL) Single phase - step type
VML-32	500 - 833 kVA	(S) Single phase - vacuum step type
VMLT-32	1200 - 4666 kVA	(S) Three phase - vacuum step type
		Siemens-Allis
JFR	72 - 833	(SL) Single phase - step type

(L) Indicates line use
(S) Indicates substation use

sc - Regulators, Voltage

Manufacturer	Conditions
General Electric	
Three-phase, step-type substation regulator Type TMLT-32 (13.2/7.62 kV)	To obtain experience.
Siemens-Allis	
Three-phase, step-type substation regulator Type SFR (13.2/7.62 kV)	To obtain experience.

sd - Current Transformers
Outdoor Type

Manufacturer	.6 kV	15 kV	25 kV	34.5 kV	69 kV
ABB	CSF/CMS CMF CLC/CLE	KOR-11 KON-11 KOT-11	ICT-150 KOR-15 KOT-15	ICT-200 KOR-20	ICT-350
Andover	DCBW DCCW DCAB				
Associated Engineering	GT HA WEO	BB-15 LG-15	BB-25 LG-25 COF-150	LG-34.5 COF-200	COF-350
G.E.C. Durham Industries (Astra)	AA&TA AB AD&AC				
Electromagnetic Industries (Square D)		CO3-110	CO3-150	CO3-200	1K-350
General Electric	JCR-0 JCW-0 JAK-0 JAD-0	JKW-5 JCK-5	JKW-6 JKW-150 KG-150	JKW-7 JKW-200 KG-200	JKW-350 KG-350
Schlumberger	R6S R6SA R6M R6L				

NOTE: The transformer types listed above are accepted in all standard ratios. Insulation class, voltages, ratios and other necessary information should be specified when ordering.

Conditional List
sd(1)
July 1995

sd - Current Transformers
Outdoor Types

Manufacturer	Conditions
Electromagnetic Ind. (Square D) Type UMCT, 0.6 kV Type UCT, 0.6 kV Type IK 4-350-69, 69 kV (cycloaliphatic resin bushings)	To obtain experience.

se - Voltage Transformers

Outdoor Types

Manufacturer	.6 kV	15 kV	25 kV	34.5 kV	69 kV
ABB	PPM	VOG-11 VOY-11 VOZ-11	LPT-150 VOG-15 VOZ-15	LPT-200 VOG-20 VOZ-20	LPT-350
Andover	DVE-6 DVF-6				
Associated Engineering	CL TL	PTT-150 SPOF-100 PTT-110	PTT-150 SPOF-150	POF-200	POF-350
Electromagnetic Industries (Square D)		PO5-110	PO5-150	PO5-200	U3-350-69
General Electric	JVA-0 JVP-0	JVW-5 JVW-110	JVW-6 JVT-150	JVW-7 JVT-200	ET-350 JVT-350
Schlumberger	T5R T6R T7R				

NOTE: The transformer types listed above are acceptable in all standard ratios. Insulation class, voltages, ratios and other necessary information should be specified when ordering.

se - Voltage Transformers

Outdoor Types

Manufacturer	Conditions
G.E.C. Durham Industries(Astra) Type DB, 0.6 kV Type DA, 0.6 kV Type DF, 0.6 kV	To obtain experience.
Electromagnetic Industries (Square D) Type U-450, 0.6 kV Type U-4-350-69, 69 kV (cycloaliphatic resin bushings)	To obtain experience.

sj - Switches, oil circuit recloser by-pass

Manufacturer	15 kV For use on 12.5/7.2 kV systems	27 kV For use on 24.9/14.4 kV systems	27 kV* For use on 34.5/19.9 kV systems	Current Rating Amperes
Chance	M3-R	M3-R	M3-R	600
Cooper Power Systems	FW77D7	FW77D9	FW77D9	600
Kearney	D73RB	D73RB		600

*Not For Use In Substations

sk - Switch, regulator by-pass - disconnect
For outdoor use

Manufacturer	15 kV for use on 12.5/7.2 kV Systems	27 kV for use on 24.9/14.4 kV Systems	Current Rating Amperes
Kearney	HB-65	HB-65	600
S & C Electric*	XL	XL	600
Siemens-Allis	HR	HR	600
Southern States	BR	BR	400,600

NOTE: All switches should be furnished with NEMA standard insulators and with 110 kV BIL rating (15 kV systems) or 150 BIL ratings (25 kV systems) for station use.

*Available with porcelain insulators. Available with "Cypoxy" cycloaliphatic epoxy insulators through 34.5 kV on request.

sk - Switch, regulator by-pass - disconnect
For outdoor use

Manufacturer	Conditions
Cooper Power Systems Type B, 15 kV, 400 amperes, 110 kV BIL for station use, 95 kV BIL for line use.	To obtain experience.

NOTE: All switches should be furnished with NEMA standard insulators and with 110 kV BIL rating for station use.

sl - Switch, Combination Power Fuse and Disconnect

(Used with an additional disconnect switch to by-pass oil circuit reclosers at substations.)

Manufacturer	15 kV for use on 12.5/7.2 kV systems	27 kV for use on 24.9/14.4 kV systems
Hi Voltage	RFH	
Kearney	MHX	MHX
S & C Electric*	SMD/LBD XS/LBD	SMD/LBD
Southern States	SF	

NOTE: All switches and cutouts should be furnished with NEMA standard insulators.

*Available with porcelain insulators. Available with "Cypoxy" cycloaliphatic epoxy insulators through 34.5 kV on request.

sr - Steel for Substation Grounding, Copper-Clad or Galvanized

(See av-2 for copper grounding conductor)

Manufacturer	Conditions
Bethlehem Steel 7/16" and 1/2" steel strand, BB grade, Class C galvanized	1. To obtain experience. 2. When used in soil with resistivity of 25 ohm-meters (2500 ohms per centimeter cube) or less, cathodic protection must be incorporated into the grounding design.
Copperweld Steel 40% conductivity DSA Copperweld Strand in sizes: 1/2" (7 No. 6 AWG) 9/16" (7 No. 5 AWG) 5/8" (7 No. 4 AWG) 13/16" (19 No. 6 AWG) 7/8" (19 No. 5 AWG)	1. To obtain experience. 2. When used in soil with resistivity of 25 ohm-meters (2500 ohms per centimeter cube) or less cathodic protection must be incorporated into the grounding design.
Indiana Steel & Wire Steel Strand, BB Grade, Class C galvanized 5/8" (19 wire) 1/2" (7 wire) 9/16" (7 wire) 7/16" (7 wire)	1. To obtain experience. 2. When used in soil with resistivity of 25 ohm-meters (2500 ohms per centimeter cube) or less cathodic protection must be incorporated into the grounding design.

vx - Cross Brace assembly, 3-3/8" x 5-3/8"
with hardware and fittings (Dwg. TM-110, RUS Specification T-7)

Manufacturer	Catalog No.
Brooks	
Item 1-vx	6685-1
Item 2-vx	6685-2
Hughes Brothers	
Item 1-vx	1042-1
Item 2-vx	1042-2
Niedermeyer-Martin	
Item 1-vx	N-6714-1
Item 2-vx	N-6714-2
Pennington	
Item 1-vx	CCC-67-1
Item 2-vx	CCC-67-2

Cross Brace assembly, 3-5/8" x 7-1/2" Min.
with hardware and fittings (Dwg. TM-110, RUS Specification T-8)

Manufacturer	Catalog No.
Brooks	6695
Hughes Brothers	2061A
Niedermeyer-Martin	N6721
Pennington	CCC69

PART II

Underground Distribution Equipment

U ae - Surge Arresters, Distribution for Underground System Pole Risers (Lightning Arresters)

Manufacturer	Arrester Class	Arrester Type	Ratings - kV
ABB	Distribution, normal duty	GLV	9, 10
	Distribution, normal duty	LVBB	18
General Electric	Distribution, heavy duty	Alugard	9, 10, 18
Joslyn	Distribution, normal duty	Q	9/10, 18
	Distribution, heavy duty	J	9/10, 18
Kearney	Distribution, heavy duty	Unigap	9, 10, 18

*Has intermediate class arrester characteristics but does not have intermediate class venting capability.

NOTE: The arresters listed on this page may be used singly or in parallel, but must be applied in accordance with paragraph VI.A., in RUS Bulletin 61-3, "Underground Rural Distribution." Other arresters listed on pages ae-1 and ae-2 may be used for underground systems when applied in accordance with this bulletin.

Conditional List
U ae(1)
July 1995

U ae - Arresters, Surge

(Shielded for Underground System Pad-Mounted Equipment)

Manufacturer	Conditions
ELBOW ARRESTERS	
Cooper Power Systems	
Metal Oxide Elbow Arrester M.O.V.E.-9/10 kV (15 kV interface) M.O.V.E.-18 kV (25 kV interface)	To obtain experience.
VariGAP, 9, 10 kV MOV Elbow(15 kV class) VariGAP, 18 kV MOV Elbow (25 kV class)	To obtain experience.
Elastimold (ESNA)	
Metal Oxide Elbow Arrester 10 kV - 167ESA - 10 (15 kV interface) 18 kV - 273ESA - 18 (25 kV interface)	To obtain experience.
Joslyn	
Metal Oxide, Elbow Arrester Type ZE, 10, 18 kV	To obtain experience.
PARKING STAND ARRESTERS	
Cooper Power Systems	
9/10 kV MOV Parking Stand (15 kV interface) 18 kV MOV Parking Stand (25 kV interface)	To obtain experience.
VariGAP, 9, 10 kV MOV Parking Stand (15 kV interface) VariGAP, 18 kV MOV Parking Stand (25 kV interface)	To obtain experience.
Elastimold (ESNA)	
10 kV MOV Parking Stand Arrester, 167PSA-10 (15 kV interface) 18 kV MOV Parking Stand Arrester, 273PSA-18 (25 kV interface)	To obtain experience.

U ae - Arresters, Surge

(Shielded for Underground System Pad-Mounted Equipment)

Manufacturer	Conditions
BUSHING ARRESTERS	
Elastimold (ESNA)	
10 kV MOV Bushing167BSA-10 (15 kV interface)	To obtain experience.
18 kV MOV Bushing273BSA-18 (25 kV interface)	

U ae - Arresters, Surge
(For Underground System Pole Risers)

Manufacturer	Conditions
ABB	
Metal Oxide, HMX Heavy Duty: 9, 10, 18 kV	To obtain experience.
Metal Oxide, RMX Intermediate Class* 9, 10, 18 kV	To obtain experience.
Metal Oxide, XPR Distribution Type; 9, 10, 18, 27 kV; Heavy Duty; (Polymer)	To obtain experience.
Cooper	
AZRP (Polymer) Distribution Type 9, 10, 18, 27 kV Heavy Duty	To obtain experience.
Internally gapped metal oxide Heavy duty (Porcelain) 9, 10, 18, 27 kV, AZR500 VariGAP	To obtain experience.
Internally gapped metal oxide Heavy duty (Polymer) 9, 10, 18, 27 kV, AZRP500 VariGAP	To obtain experience.
Metal Oxide, AZR VariSTAR Heavy Duty (Porcelain) 9, 10, 18, 27 kV	To obtain experience.
General Electric	
Metal Oxide, Tranquell** U.D. II 9, 10, 18 kV	To obtain experience.
Metal Oxide, Tranquell Intermediate Class 9, 10, 18, 27 kV	To obtain experience.

*Has intermediate class arrester characteristics but does not have intermediate class venting capability.
**A non fragmenting U.D. II Arrester is available for 9 & 10 kV designs at higher cost when specified.

U ae - Arresters, Surge

(For Underground System Pole Risers)

Manufacturer	Conditions
Joslyn	
Metal Oxide, Type ZJ U.D. 9, 10, 18 kV	To obtain experience.
Metal Oxide, Type ZR Intermediate Class* 9, 10, 18 kV	To obtain experience.
Metal Oxide, Type ZJP Heavy Duty; (Polymer) 9, 10, 18, 27 kV	To obtain experience.
Kearney	
Metal Oxide Univar Type SGR 9, 10, 18, 27 kV	To obtain experience.
Ohio Brass	
Metal oxide type DynaVar 9, 10, 18kV Polymer PVR	To obtain experience.
Metal Oxide, DynaVar Intermediate Class 9, 10, 18 kV	To obtain experience.

*Has intermediate class arrester characteristics but does not have intermediate class venting capability.
**A non fragmenting U.D. II Arrester is available for 9 & 10 kV designs at higher cost when specified.

U an - Transformers, distribution
pad-mounted, dead-front

(For underground application)

Applicable Specifications: "RUS Specifications for Pad-Mounted Transformers," U-5.

Manufacturer	Single Phase	Three-Phase
ABB (2, 4)	"Mini-Pak U-5" 25-167 kVA	Type MTR 75-1500 kVA "Plazapad-U5" 2000-2500 kVA
Central Moloney (2, 4)	"REA-LP" 25-167 kVA	
Cooper (2, 4)	"REA Shrubline 15-167 kVA	"REA Terra-Tran" 45-2500 kVA
ERMCO (2, 4)	"Low-Profile" 10-167 kVA	
General Electric (2, 4)	"Mini-Pad III - REA" 10-167 kVA	"Compad IV - REA" 75-2500 kVA
Howard (2, 4)	"Hi Pad REA" 10-167 kVA	"Hi Pad 3 REA" 45-2500 kVA
Kuhlman (2, 4)	"Lo-Pak ELR" 25-167 kVA	"K-PAK-3 REA" 750-2500 kVA
H. K. Porter (Delta-Star) (2, 4)	"Low Profile U 5-R" 25-167 kVA	"Porter U5-R3" 225-2500 kVA
Pauwels Tranformers (2,4)	"Turf-Hugger-R" 10-100 kVA	"Turf-Hugger-R" 45-2500 kVA
United (KAEC) (1) (6)	"Pad-Mount" 15-100 kVA "Pad-Mount" 25 & 50 kVA	
VanTran (3, 4)	"Mini-Pad U5" 5-167 kVA	"VanTran III-U5" 30-2500 kVA

(1) 7.2/12.5 and 7.6/13.2 kV
(2) 7.2/12.5, 7.6/13.2 and 14.4/24.9 kV
(3) 7.2/12.5 and 7.6/13.2 kV (conditional listing for 14.4/24.9 kV)
(4) Dual Voltage - Same as for 14.4/24.9 kV, single phase
(5) Three-phase listing applies to 7.2/12.5 and 7.6/13.2 kV only
(6) 14.4/24.9 kV

NOTE: The enclosures for these transformers have been certified as meeting the requirements of ANSI C57.12.28. A copy of the certification is available from the manufacturer.

U an - Transformers, Distribution
Pad-Mounted, Dead-Front

(For unit residential underground application, 7.2/12.5 and 7.6/13.2 kV, 5-25 kVA single phase only)

Manufacturer	Type
ABB	"Micro-Pak U-5" 10-25 kVA
Central Moloney	"REA-Mini-LP" 10-25 kVA
Cooper	"Ranch Runner" 10-25 kVA
ERMCO	"REA-MicroTrim" 10-25 kVA
General Electric	"Micro-Mini-Pad" 10-25 kVA
Howard	"Spacesaver Pad" 10-25 kVA

NOTE: The enclosures for these transformers have been certified as meeting the requirements of ANSI C57.12.28. A copy of the certification is available from the manufacturer.

U an - Transformers, Distribution
Pad-Mounted, Dead-Front

(For underground application)

Manufacturer	Conditions
ABB 7.2/12.5, 7.62/13.2, 14.4/24.9 and Dual Voltage	
Single-phase type "Mini-Pak U-5", Single-phase type "Micro-Pak U-5", three phase type MTR, all with internal UMX Under-Oil Arrester or with internal "Tranquell" Under- Oil Arrester	To obtain experience.
Cooper Power Systems 7.2/12.5, 7.62/13.2, 14.4/24.9 kV and dual voltage single phase, self protected, padmount distribution transformer with Magnex Interrupter	To obtain experience.
Above or fully accepted, with Type AZU, MOV, heavy-duty under-oil arrester.	To obtain experience.
ERMCO Single phase transformers with internal "Tranquell" under oil arrester "Low-Profile 10-167 kVA, 7.2/12.5, 7.62/13.2 14.4/24.9 kV and Dual Voltage	To obtain experience.

U an - Transformers, distribution
Pad-Mounted, Dead-Front
(For underground application)

Manufacturer	Conditions
General Electric	
Single phase transformers with internal Tranquell Under-Oil Arrester	To obtain experience.
"Mini-Pad III - REA" (10-167 kVA) 7.2/12.5 and 7.6/13.2, 14.4/24.9 kV and Dual Voltage "Micro-Mini-Pad" (10-25 kVA) 7.2/12.5 and 7.6/13.2 kV	To obtain experience.
Three phase transformers with internal Tranquell Under-Oil Arrester "Compad IV-REA" 7.2/12.5, 7.6/13.2, 14.4/24.9 kV and Dual Voltage	To obtain experience.
Single-phase "Mini Pad-REA" 10-100 kVA transformers with amorphous metal cores 7.2/12.5, 7.6/13.2, 14.4/24.9 kV and Dual Voltage	To obtain experience.
Three-phase transformers 75-750 kVA with amorphous metal core"Compad IV-REA" 7.2/12.5, 7.6/13.2, 14.4/24.9 kV and Dual Voltage	To obtain experience.
Howard Industries	
Transformers listed below with "Tranquell" or "AZU" under-oil arresters: 7.2/12.5, 7.62/13.2, 14.4/24.9 kV & Dual Voltage Single-phase, "Hi-Pad REA" 10-167 kVA, "Spacesaver Pad" 10-25 kVA Three-phase, "Hi-Pad 3 REA" 45-2500 kVA	To obtain experience.
Square D	
Three-phase Class 7230 REA 75-2500 kVA, 7.2/12.5 & 7.62/13.2 kV	To obtain experience.

NOTE: The enclosures for these transformers have been certified as meeting the requirements of ANSI C57.12.28. A copy of the certification is available from the manufacturer.

U ax - Cutout and Arrester, Combination for Underground System Pole Risers

Nominal System Voltage	For 12.5Y/ 7.2 kV		For 13.2Y/ 7.6 kV	For 24.9Y/ 14.4 kV
Cutout Maximum Voltage Rating	7.8 kV	15 kV	15 kV	27 kV
Application	1ø Risers	3ø Risers	1ø and 3ø Risers	1ø and 3ø Risers
Cutout Current Rating	100 amps	100 amps	100 amps	100 amps

Manufacturer	Catalog Numbers			
ABB	7.8LBU-II/ 10 LV	15LBU-II/ 10 LV	15LBU-II/ 10 LV	24.9LBU-II/ 18 LV
Chance	C7 Series	C7 Series	C7 Series	C7 Series
Cooper	AFS300B Series	AFS300C Series	AFS300C Series	AFS300D Series
General Electric	9F80	9F80	9F80	9F80
Southern States	CA Series	CA Series	CA Series	CA Series

NOTE: The units listed on this page may be used with single arresters or arresters in parallel, but must be applied in accordance with paragraph VI.A. in RUS Bulletin 61-3, "Underground Rural Distribution." Other arresters listed on pages ae-1 and ae-2 may be used for underground systems when applied in accordance with this bulletin.

Cutouts used on underground riser poles should be loadbreak type or have hooks for portable load interrupters.

Either normal duty or heavy duty distribution class arresters listed on page ae-1 are acceptable for use with these combination units.

U ax - Cutout and Arrester

Combination for Underground System Pole Risers

Metal Oxide Type Arresters

Nominal System Voltage	For 12.5Y/7.2 kV		For 13.2Y/7.6 kV	For 24.9Y/14.4 kV	Conditions
Cutout Maximum Voltage Rating	7.8 kV	15 kV	15 kV	27 kV	
Application	1ø Risers	3ø Risers	1ø and 3ø Risers	1ø and 3ø Risers	
Cutout Current Rating	100 amps	100 amps	100 amps	100 amps	
Manufacturer	Catalog Numbers				
Joslyn (Distribution)	J9237-ZJ2	J9237-ZJ2/R	J9237-ZJ2/R	J9267-ZJ2	To obtain experience

Note 1: Other arresters listed on pages ae-1 and ae-1 may be used for underground systems when applied in accordance with RUS Bulletin 61-3, "Underground Rural Distribution."

Note 2: Cutouts used on underground riser poles should be loadbreak type or have hooks for portable load interrupters.

U be - Reclosers, pad-mounted

Manufacturer	Conditions
Cooper Power Systems Single phase, vacuum interrupter, Type PV4H Maximum voltage 14.4 kV for 12.5 and 13.2/7.62 kV	To obtain experience.

NOTES:

1. Series trip reclosers with ratings greater than 100 amp for 12.5/7.2 kV application, greater than 200 amp for 24.9/14.4 kV application, and 280 amp for 34.5/19.9 kV application are acceptable only with ground trip device. Shunt trip reclosers without ground trip devices may not be used with trip settings higher than 200 amp for 12.5/7.2 kV application, greater than 400 amp for 24.9/14.4 kV application, and 560 amp for 34.5/19.9 kV application.

2. Reclosers are not acceptable with load current, bushing CT battery chargers.

U cg - Switch, air, three-pole, group-operated
for pole-mounted cable risers
(Factory Preassembled)

Manufacturer	Mounting	Vertical Break Type kV	Side Break Type kV
ABB	Vertical	LB3-VR(L)15	
Chance	Vertical		D7(L)15-27
	Horizontal		D7(L)15-27
Kearney/KPF	Horizontal	SB_R(L) 15-35	
S & C*	Vertical		Alduti(L)15-25
	Horizontal		Alduti(L)15-25

(L) Means gas or solid material full-load interrupters are accepted and available.

NOTE: Switches with factory-assembled crossarm type bases must have nonconducting crossarm type bases, nonconducting braces, and insulated interphase and control rods.

*Available with porcelain insulators. Available with "Cypoxy" cycloaliphatic epoxy insulators through 34.5 kV on request.

U cg - Switch, Air, Three-Pole, Group Operated

Manufacturer (Meeting No.)	Conditions
Chance Type S (L) side-break, horizontal and vertical mounting, with non-conducting crossarm type base and insulated interphase and control rods, 15 and 25 kV.	To obtain experience.
S & C* Omni-Rupter (L), side break horizontal and vertical mounting with non-conducting crossarm type base and insulated interphase and control rods, 15 kV and 25 kV	To obtain experience.

(L) Means full-load interrupter accepted and available.

*Available with porcelain insulators. Available with Cypoxy insulators through 34.5 kV on request.

U fw - Secondary Tap Connector

Manufacturer	Type or Catalog No.
Raychem	Compression Connectors CRSM-CT-1-150 CRSM-CT-2-200 CRSM-CT-3-250 Standard Split Bolt CRSM-CT-2-200

U fz - Transformer Connector Block, Insulated
Multiple Cable Connectors

Watertight - For use in all locations

Manufacturer	Connection Type	Catalog Number
Blackburn	Lug	SCU, with lugs and sleeves
Burndy	Lug	Stud Mole with sealing sleeve
Utilco	Set Screw	PTF-SS, Watertight Insulated transformer Connector block

Non-Watertight - For use in above grade locations only

Alcoa	Lug	Interchange 1 ABBD Series (Disconnectable) Use with A9 insulating boots
Alcon	Set Screw	VBTT Series with double sealing sleeve
Blackburn	Set Screw	TSB-J58C (Permanent)
	Set Screw	TSB-D58C (Disconnectable)
Burndy	Set Screw	K-D Series (Disconnectable) K-DF Series (Permanent)
Connector Mfg. Co.	Set Screw	Uni-Joint Bar Connectors, (Series RLS, NSM-C, NDS-C, NSC ZS-C, ZSU-C, RLUS) (Permanent)
	Set Screw	Uni-Joint Bar Connectors, (Series RLSS, NSSM-C, NSSC, ZQC, ZQU-C, RLUSS) (Disconnectable)
ESP	Lug	Types SUR and RDSR(Removable) (With Types LA and AL-lugs and Sleeve kits)
	Set Screw	Type UPSO-I (Permanent) Type UPM-I (Disconnectable)
Fargo	Bolted	GUC Series
	Set Screw	GUS-600S Series
Homac	Lug	DF Series
	Lug	FTU 125 Series(Disconnectable) with flood seal sleeve kit
	Set Screw	LRT Series
Penn Union	Lug	Type DBAT (Permanent)
	Lug	Type DBAT-LH (Disconnectable) Use with Series DBTB, DBTBF and DBTH lug and Sleeves kits
Preformed	Set Screw	SC-C series (Permanent)
	Set Screw	SC-Q-C series (Disconnectable)
Reliable	Set Screw	15912-REA (Disconnectable)
Utilco	Set Screw	PTF-IN (Permanent)
	Set Screw	PTF-CJNU (Disconnectable)
Vector Connectors Corp.	Set Screw	TQL Series (Disconnectable) (with insulating boot)

Note: Additional insulation may be required with some of the above-listed secondary terminal blocks due to the irregularity of mating surfaces between various secondary studs being supplied by the transformer manufacturers.

U gc - Shield, cable riser

Manufacturer	Dia. (Inches)	Length (Feet)
	Galvanized Steel	
Chance	2 - 3 - 3-1/2	5 - 9
*Cooper Power Systems	2 - 3 - 4	3 - 5 - 10
*Electrical Materials	2 - 3 - 4 - 5	5
*Joslyn	2 - 3 - 3-1/2	5 - 8
Midland-Ross (Kindorf Snapduct)	2 1/2 - 3 1/2 - 5 (14 ga. galv. steel)	2 1/2 - 5 - 10
	Plastic and Fiberglass	
*Carlon	2 - 3 - 4 - 5 - 6	10
*Custom Plastics	2 - 3 - 4 - 5	5 - 10
*Electrical Materials (plastic)	2 - 3 - 4 - 5	5 - 10
*Applied Extrusion Technologies (plastic) (Power Mold, I, II, III)	2 - 3 - 4 - 5	5 - 9 - 10
*Joslyn (plastic)	2 - 3 - 4 - 5	5 - 10
*Nordic (fiberglass)	2 - 3 - 5	5 - 10

(Order by size and length)

#All sizes available with galvanized finish or painted-over galvanizing.

*All sizes available with back plate.

	Full Round**	
Smith Fiberglass Products (standard wall)	2 - 3 - 4 - 5	30

**Full round riser shield is to be mounted directly to the surface of the pole with no standoffs.

U gk - Terminations, Indoor

(When ordering specify conductor size, type, whether copper or aluminum and insulation diameter.)

Manufacturer	Catalog No.
Chardon Electrical Components	Termi-Matic, Type A or G (15, 25 & 35 kV)
Cooper Power Systems	Fasterm Stress Cone (15 & 25 kV)
Elastimold (ESNA)	Style 35-MSC (15, 25 & 35 kV)
Joslyn	JPT series (15, 25 kV)
Plymouth/Bishop	Stress-Wrap (15, 25 & 35 kV)
Raychem	Thermofit HVT (15, 25 & 35 kV)
Sigmaform	Q-Cap Series STK-I (15 & 25 kV)
3M	Quick Term II Series (15, 25 & 35 kV)

U gk - Terminations, outdoor (with mounting hardware)*

(When ordering, specify conductor size, type, whether copper or aluminum, insulation diameter, and type of mounting desired.)

Manufacturer	Catalog Number
	POLYMER
Chardon Electrical Components	Termi-Matic, Type G (15, 25 and 35 kV)
Cooper Power Systems	Fasterm Series (15 & 25 kV)
Elastimold (ESNA)	Style 16-THG (15 and 25 kV) (for bare concentric neutral cable) Style 35-MT (35 kV) (for bare concentric neutral cable) Style PCT-1 (15 kV) (for jacketed cable) Style PCT-2 (25 kV) (for jacketed cable)
Joslyn	JPT Series (15, 25 kV)
Plymouth/Bishop	SWO Kit (15, 25 and 35 kV)
Raychem	Thermofit HVT (15, 25 and 35 kV)
Sigmaform	Q-Cap Series STK (15 & 25 kV)
3M	5900 Series 15 kV (4/0 AWG and larger) 25 kV (#2 AWG thru 750 kcmil) "Quick-Term II" (15, 25 and 35 kV) 5600 Series (for bare concentric neutral cable) 5640 and 5650 Series (for jacketed cable)
	PORCELAIN
G & W	"Eliminator" 15 kV, E 25 kV, E 35 kV, E
Joslyn	"Easy-On II" (15, 25 and 35 kV)

*Mounting Hardware is used to attach termination to mounting bracket (U hd or U hj).

NOTE: Some of the above terminators may require ordering the mounting hardware separately.

U gn - Enclosures, equipment

Applicable Specifications: "RUS Specifications for Equipment Enclosures," U-4

Manufacturer	Catalog No.
Durham	AT-42 Series (dead-front) AT-54 Series (dead-front)
Elliott	EPM-PTS (dead-front)
Kearney/Western Power Products	300 Series
Malton Electric	ME Series (dead-front) MEV Series (dead-front)
Maysteel	EL100 (dead-front)
Nordic	ND-28 and ND-33

NOTE: 1. The above enclosures are available with various multipoint terminations. The owner should specify termination points to be provided.

2. These enclosures have been certified as meeting the requirements of ANSI C57.12.28. A copy of the certification is available from the manufacturer.

U gn - Enclosures, Equipment

Sectionalizing Enclosures

Manufacturer	Catalog No.
Cooper Power Systems	SecTER Series I and II (Single-Phase and Three-Phase)
Durham	AMSP( ) Series
Kearney/Western Power Products	310 Series
Malton Electric	ME Series MEH Series
Maysteel	CW200 Series CW300 Series
Nordic	ND Series
Power Design Inc.	Type CJP series, single-phase and three-phase, 15 and 25 kV
Rough Rider Industries	Series RUF93
Shallbetter	SPMS Series (dead-front)

NOTE: 1. The above enclosures are available with various multipoint terminations. The owner should specify termination points to be provided.

2. These enclosures have been certified as meeting the requirements of ANSI C57.12.28. A copy of the certification is available from the manufacturer.

U go - Fault Indicator
(For Construction Unit UM6-4)

Manufacturer	Type
Cooper Power Systems	Linam TPR, LV, MR
Edison Control Corporation	Series EC100 (single phase) Series EC300 (three phase) (Available with mounting kit KT5002)
Fisher Pierce	Series 1514 (current reset, single-phase Series 1515 (current reset, three-phase) Series 1541 (time reset, single-phase Series 1543 (time reset, three-phase Series 1547 (adaptive trip)

U gp - Connector Blocks and Splices, Secondary

Watertight - For Use In All Locations

Manufacturer	Connection Type	Catalog Number
Alcon	Set Screw	VPB Series
Blackburn	Lug	Series UP (with lugs and sleeves)
	Set Screw	Series USB (1000 amp bus with sleeves)
Burndy	Lug	URD Mole
Connector Mfg. Co.	Compression	Utilug Sure Seal Splice Kits, Series SSK, SSKL
	Set Screw	Uni-Joint Sure Seal Series SSBC
	Set Screw	Secondary Connector ULS2-350
ESP	Lug	Type UC (8 AWG - 500 kcmil) (with LA lug and sleeve)
	Set Screw	Type UPP
Fargo	Set Screw	GU-600 Series
Homac	Connector Blocks:	
	Lug	FS-95 Series with flood seal sleeve kit (8AWG - 350 kcmil)
	Lug	FS-125 Series with flood seal sleeve kit (350 - 500 kcmil)
	Set Screw	SHC Series
	Set Screw	RAB Series
	Splices:	
	Compression	RRK Series (#2AWG - 350 kcmil)
	Set Screw	UH11L
	Set Screw	USK Series
	Set Screw	MTB Series
Kearney	Compression	HCR
	Compression	HAR
Penn Union	Lug	DBA Series with DBTB, DBTBF and DBTH Series lug and sleeve kits
Reliable	Set Screw	15903-15908, 15910 with sleeve kit (4 AWG - 350 kcmil) 15911 with sleeve kit (500 - 750 kcmil)
Utilco	Set Screw	Safety Sub Splice - USPA-350SS

U gp - Connector Blocks and Splices, Secondary

Non-Watertight - For Use In Above-Grade Pedestals Only

Manufacturer	Connection Type	Catalog Number
Blackburn	Set Screw	Type PSB-C
Connector Mfg. Co.	Set Screw	Uni-Joint Series NCA
ESP	Set Screw	UPC Series
Fargo	Set Screw	GUS-6000 Series
Homac	Set Screw	CLR-350 Series
	Set Screw	PVAB Series
Utilco	Set Screw	PED-350-IN Series
Vector Connectors Corp.	Set Screw	PC Series

U gq - Boot or sleeve, insulated*

Manufacturer	Catalog Number
Blackburn	MPC9 MPC15
Electrical Materials	100-B (For pad-mounted transformer spade terminals)

*Use restricted to 120/208 volt 500 kVA transformers and larger not equipped with threaded studs.

U gu - Pedestal, Power
(Above-Grade)
Refer to Construction Drawings UK5

Applicable Specifications: "RUS Specifications for Secondary Power Pedestals," U-6

Manufacturer	Inside Dimensions Inches	Height Inches	Catalog No.
Coil Sales (Charles Industries)	8.25 Dia	31-1/2	CPLP-8
	8.25 Dia	31-1/2	CPLP-8I(Integral Stake)
	10.75 Dia	31-1/2	CPLP-10
	10.75 Dia	31-1/2	CPLP-10I(Integral Stake)
Electrimold	14.5 x 19.5	31.5	ESP-1419-31
	23 x 23	30	ESP-2323-30
Fiberglas Fabricators	14 X 9	31	FFSP Series
	15.5 X 15.5	30	FFSP Series
	15.5 X 15.5	36	FFSP Series
	14 X 9	42	FFSP Series
	9 X 9	31	FFSP Series
Kearney/Western Power	9-1/2 x 9-1/2	30	*SPM-9 DF3
	14-1/2 x 9-1/2	30	*SPM-14 DF3
	9-1/2 x 9-1/2	36	SPM-91 DF3
	9-1/2 x 9-1/2	30	SPM-90 DF3
	14-1/2 x 9-1/2	30	SPM-140 DF3
	14-1/2 x 9-1/2	36	SPM-145 DF3
	18-1/2 x 12	30	SPM-182 DF3
	18-1/2 x 12	54	SPM-190 DF3
Nordic	8 x 8	44	PR-50, PR-55
	9 x 14	30	PR-149 (stake)
			PR-150 (stakeless)
	8-1/4 x 13	30	PRMC-150 (stakeless)
	8-1/4 x 13	36	PRMC-190 (stakeless)
Reliable	8 x 8	38	UP 8HLP
	8 x 8	46	UP 8HP
	10-1/2 x 10-1/2	26	UP 10HLP
	16-1/2 x 10-1/2	36	UP 1016HLP
	10-1/2 x 10-1/2	42	UP 10HP
Shallbetter	7.5 x 10.25	39	SUTP Series
Utility Fiberglass	27 x 16	40	PPFP-2700
Vertex	8 x 14	30	SP 814

*Furnished with stake.
**Pole mounted

U gu - Power Pedestal
(Below-Grade)
Refer to Drawings UK6

Applicable Specifications: "RUS Specifications for Secondary Power Pedestals," U-6

Manufacturer	Catalog No.
Armorcast	Polymer concrete frame and cover with fiberglass reinforced polyester skirting 6001 Series.
Associated Plastics	Molded polyethylene with galvanized steel or plastic cover Catalog Nos. 1730-1, 3; 1324-1, 3
Blackburn	Molded polyethylene with galvanized steel cover and ground lug. Catalog No. SDR-2PG
Burndy	Molded polyethylene with galvanized steel cover. Catalog No. URD20G23
Carson	Molded polyethylene with plastic cover Catalog No. 1324-12B and 1730-12B
CDR Systems (Homac)	Fiber reinforced polymer concrete PA Series with penta-head bolts
Christy Concrete	Polyester reinforced plastic Series FL8TRCBOX, FL9TRCBOX, FL30TRCBOX, FL36TRCBOX
Dexol	HDPE, DX-101 DX-102 ABS, DX-101HD DX-102HD
Electrimold	Polymer concrete ring and cover with fiberglass reinforced skirting E series
Fargo	HDPE, B-100R Series ABS, B-200R Series
Fiberglas Fabricators	FFHH Series, Fiberglass FFHHPC Series, Fiberglass polymer concrete hybrid
Highline	HL50AE HL51

U gu - Power Pedestal
(Below-Grade)
Refer to Drawings UK6

Applicable Specifications: "RUS Specifications for Secondary Power Pedestals," U-6

Manufacturer	Catalog No.
Malton	Fiberglass secondary pedestal FSP31139, FSP301515
Pen-Cell	Molded polyethylene with galvanized steel or plastic cover Catalog No. PE-20-REA Polycarbonate Box cover Catalog No. AG-20-6-REA
Quazite	Power Pedestal - PV Boxes - PX/PE Series, PR/LR Series, PC, PG, LG Series
Thermodynamics	PP-91 and PPV-91 Series

U gv - Stake, Power Pedestal
Refer to Construction Drawing UK5

Manufacturer	Length Inches	Catalog No. For Power Pedestal Only	Catalog No. For Joint Pedestal
Fargo	42-60-72-78	UP-530S Series	UP-530J Series
Reliable	72-78-84	DM Series	DM Series

U hb - Cable Accessories
(When ordering specify conductor size, type whether copper or aluminum and insulation diameter)

(Items on this page are rated for operation on three-phase systems and may be used on single-phase systems.)

200 Ampere Continuous Current Rating

Manufacturer	Catalog No.
Chardon Electrical Components	15 kV, used with loadbreak connectors Switch module 9U02AAB001 Basic connector module 9U05 Series Insulating cap 9U01AEW400 Feed-through insert 9U04AEB001 25 kV, used with loadbreak connector switch module 9U02BAB001 Insulating cap 9U01BEW500 Feed-through insert 9U04BEB001
Cooper Power Systems	15 kV, used with loadbreak connectors No. 2603711U protective cap No. 2604797B01M bushing well insert No. 2637869C01M rotatable two-way bushing well insert No. 2604231B01 bushing well plug 25 kV, used with loadbreak connectors No. LPC 225 protective cap No. 2637612C01M bushing well insert No. 2637881C01M rotatable two-way bushing well insert No. 2604231B01 bushing well plug 35 kV, used with loadbreak connectors No. 2637592B03M protective cap

U hb - Cable Accessories

(When ordering specify conductor size, type, whether copper or aluminum and insulation diameter)

(Items on this page are rated for operation on three-phase systems and may be used on single-phase systems.)

200 Ampere Continuous Current Rating

Manufacturer	Catalog Number
Elastimold (ESNA)	15 kV, used with loadbreak connectors Style 1601-CL cable lead Style 1602A3R feed thru insert Style 1601-A3R bushing plug Style 160-DR insulating cap
	25 kV, used with loadbreak connectors Style 2701-A2 bushing plug Style 270-DR deadend receptacle
	35 kV, used with loadbreak connectors Style 3701A-3 bushing plug* Style 370DR(G) insulating cap
Joslyn	15 kV, used with loadbreak connectors Type LBIC152 Insulating Cap
	25 kV, used with loadbreak connectors Type LBIC252 Insulating Cap

U hb - Cable Accessories

(When ordering, specify conductor size, type, whether copper or aluminum and insulation diameter)

600 Ampere Continuous Current Rating

Manufacturer	Catalog Number
Cooper Power Systems	15 kV Deadbreak termination connectors Bol-T System T-OP II System Push-OP System Optional 200 A. loadbreak tap No. 2638460B 25 kV Deadbreak termination connectors Bol-T System T-OP II System Push-OP System Optional 200 A. loadbreak tap No. 2637978C 35 kV Deadbreak termination connectors Bol-T System T-OP II System Push-OP System Optional 200 A. loadbreak tap No. 2637449C
Elastimold (ESNA)	15 kV, used with non-loadbreak connectors 600, 650 Series 25 kV, used with non-loadbreak connectors K600, K650 Series 35 kV, used with non-loadbreak connectors 750LR Series
Joslyn	15 kV, used with non-loadbreak connectors PES86/PSS86 25 kV, used with non-loadbreak connectors PES86--S/PSS86--S
3M	15 kV, Deadbreak termination connectors 5815 Series Modular Splicing System

U hb - Cable Accessories

(When ordering specify insulation diameter)

Concentric Neutral Clamps (Bonding)

Manufacturer	Conditions
Harco URD cable clamp	1. To obtain experience. 2. Only for bonding of anodes or other metals to the neutrals of existing cable installations. 3. Not to be used to connect neutral to grounding electrodes.

U hc - Cable Supports
15 and 25 kV

Manufacturer	Catalog Number	Grip Dia. Range (inches)
Aluma-Form	CS-800 Series	0.75 to 2.0
Economy Cable Grip	SPJ087-U	0.87 to 1.00
	SPJ100-U	1.00 to 1.12
	SPJ113-U	1.12 to 1.25
	SPC125-S-U	1.25 to 1.50
Fargo	GJ-854	0.718 to 0.919
	GJ-855	0.920 to 1.12
	GJ-856	1.12 to 1.50
Kellums	022-16-011	0.81 to 0.94
	022-16-012	0.87 to 1.00
	022-16-013	0.94 to 1.06
	022-16-014	1.00 to 1.18
	022-16-015	1.06 to 1.25
	022-01-018	1.25 to 1.50
Lewis	A-U-SW-18	0.75 to 1.25
	U-1.12	1.12 to 1.62
Slater	FCSD 14	0.82 to 0.95
	FCSD 15	0.88 to 1.00
	FCSD 16	0.95 to 1.06
	FCSD 17	1.01 to 1.19
	FCSD 18	1.07 to 1.26
	FC125-U	1.25 to 1.50
Woodhead	35032 (SC075-U)	0.75 to 0.99
	35033 (SC100-U	1.00 to 1.24
	35034 (SC125-U)	1.25 to 1.49

U hd - Brackets, pothead mounting and Brackets, combination pothead and arrester mounting

Manufacturer	Single Phase	Three Phase
Aluma-Form	TB-EMB-1-2PA	TB-EMB-1-6PA

U he - Enclosures, Sectionalizing Equipment

12.5/7.2 kV

Manufacturer	Catalog Number
ABB	UTE, PAD-PAK pad-mounted switching device, single and three-phase, 300 amp
Cooper Power Systems	EH3A Series, single-phase, pad-mounted
Durham	AFSP Series, single-and three phase
Electrical Equipment	FTDF-P Series, single and three-phase one and two fused taps, pad-mounted
Elliott	Type EPMR, single and three-phase, pad-mounted
Malton	*ME Fused Series, single and three-phase pad mounted.
S & C	Mark III, Models PMS (with option G-7) 200 ampere three-pole switching and 200 ampere single-pole switching
Shallbetter	SPMD Series, single and three-phase, pad-mounted SPMC Series, 200 ampere single-pole switching

*Furnished with current limiting fuses.

NOTE 1. Enclosures on this page must comply with the dead-front requirements of RUS Spec. U-4.

2. These enclosures have been certified as meeting the requirements of ANSI C57.12.28. A copy of the certification is available from the manufacturer.

3. Single-pole switching of three-phase underground circuits may cause ferroresonance. Refer to RUS Bulletin 61-3.

U he - Enclosures, Sectionalizing Equipment

24.9/14.4 kV

Manufacturer	Catalog Number
ABB	UTE, PAD-PAK pad-mounted switching device, single and three-phase, 200 amp
Cooper Power Systems	Type LBS, single- and three-phase, pad-mounted, 300 amp FuseTER Series, single-phase and three-phase
Durham	AFSP Series, single-and three phase
Elliott	Type EPMR, single- and three-phase, pad-mounted
Malton	ME Fused Series, single and three phase, pad-mounted
Shallbetter	SPMD Series, single and three-phase, pad-mounted

NOTE 1. Enclosures on this page must comply with the dead-front requirements of RUS Specification U-4.

2. These enclosures have been certified as meeting the requirements of ANSI C57.12.28. A copy of the certification is available from the manufacturer.

3. Single-pole switching of three-phase underground circuits may cause ferroresonance. Refer to RUS Bulletin 61-3.

U he - Enclosures, Sectionalizing Equipment

(200 and 600 amp)

Manufacturer	Catalog Number
Chance	Type LVS (pad-mounted) single-phase and three-phase, vacuum switching equipment, fused or unfused, 200 or 600 amp, 15-25 kV Type AIS padmounted, air insulated switchgear, fused or unfused, 200 or 600 amp, 15 kV or 25 kV
Cooper Power Systems	Type VFI, single-phase and three phase, padmounted fault interrupters, 15-35 kV Type LBS, single- and three-phase, pad-mounted 15 kV Type R-VAC, three-phase vacuum switchgear, 15-25 kV
Electrical Equipment	Type PSI-PSI/II Series, 15 kV, 25 kV, 600 amp., three-phase switching, and 200 amp., single-phase switching. (When ordering, add suffix B-4) Type PSE Series, 15 kV, 25 kV, 600 amp switch, 200 amp fuse Type PGE Series, 15 kV, 25 kV, SF6 interrupter, 3-phase, 600 amp switch, 200 amp fuse
Elliott	Type EPMR, Single and three-phase, pad-mounted, 25 kV
G & W	Type PVI series, single-phase and three-phase, 200 amp and 600 amp, 15 kV and 25 kV
Joslyn	Types PG6, PFG6, LPG6, LPFG6, (pad-mounted, fused or unfused) single and three-phase switching equipment, 200 and 600 amp, 15 or 25 kV

Note 1: Enclosures on this page must comply with the deadfront requirements of RUS Spec. U-4.

2. These enclosures have been certified as meeting the requirements of ANSI C57.12.28. A copy of the certification is available from the manufacturer.

3. Single-pole switching of three-phase underground circuits may cause ferroresonance. Refer to RUS Bulletin 61-3.

U he - Enclosures, Sectionalizing Equipment

(200 and 600 amp.)

Manufacturer	Catalog Number
Kearney	Series VP - submersible, single-phase and three-phase, vacuum switching, 200 or 600 amp, 15 and 25 kV, with or without VACOP remote operator
Malton	MES 100 Series, pad-mounted single phase and three phase switching
Scott Engineering	Type SPM-REA, 15 kV, 25 kV, 600 amp., three-phase switching, and 200 amp., single-phase switching
S & C	Mark III, Model PMH (with option G-7), 15-25 kV, 600 amp., three-phase switching and 200 amp., single-pole switching Model PME-15-25 kV, Fully enclosed live parts at all times, three-phase switching and 200 amp single pole switching
Trayer	800 Series, pad mounted three-phase vacuum switching equipment, 200 and 600 amp., 15-25 kV with or without fusing 501 submersible vacuum fuse enclosure, deadfront 200 or 600 amp., 15-25 kV Type SSA (submersible, fused and unfused) 200 and 600 amp., 15-25 kV

Note:
1. Enclosures on this page must comply with the deadfront requirements of RUS Spec. U-4.
2. The enclosures have been certified as meeting the requirements of ANSI C57.12.28. A copy of the certification is available from the manufacturer.
3. Single-pole switching of three-phase underground circuits may cause ferroresonance. Refer to RUS Bulletin 61-3.

U hf - Jacketed Cable Restoration Kits
(For resealing concentric neutral wires after installation of splices in jacketed underground cable.)

(When ordering, specify diameter of cable over jacket.)

Manufacturer	Conditions
Elastimold	
PCS-1 Power Cable Seal	To obtain experience.
Homac	
CNC Series Concentric Neutral Cover	To obtain experience.
Raychem	
WCSM (Tubing Type)	To obtain experience.
MWTM (Tubing Type)	
CRSM (Wraparound Type)	
3M	
HSJ Series (Heat Shrink)	To obtain experience.
SJ Series (Cold Shrink)	

U hf - Terminator Sealing Kits
(For resealing concentric neutral wires after installation of elbows or outdoor terminations on jacketed underground cable.)

(When ordering, specify diameter of cable over jacket.)

Manufacturer	Conditions
Elastimold 200 ECS Elbow Cable Shield, Cold Shrink	To obtain experience.
Homac CNC Series Concentric Neutral Cover	To obtain experience.
Raychem ESA, Heat Shrink	To obtain experience.
3M 8450 Series, Cold Shrink	To obtain experience.

U hf - Jacketed Cable Grounding Kits
(For connecting a grounding lead wire to the concentric neutral wires and resealing the jacket.)

(When ordering, specify diameter of cable over jacket.)

Manufacturer	Conditions
3M	
Model 2252 Cable Grounding Kit	To obtain experience.
CANUSA-EMI	
Model CFGK-REA Cable Grounding Kit	To obtain experience.
Raychem	
Model JGK Cable Grounding Kit	To obtain experience.

U hj - Bracket, combination arrester, cutout and pothead mounting

Applicable Drawing: UM2, UM2A, UM2-4

Manufacturer	Single Phase	Three-Phase
Aluma-Form	1HCA-18-1PB Series	---
Cooper Power Systems	DC51B1	DC52B1

U hp - Terminations, Elbow
(rated for switching on three-phase systems)

(When ordering, specify conductor size, type, whether copper or aluminum and insulation diameter)

Manufacturer	Catalog Number
Chardon Electrical Components	15 kV, Loadbreak 9U01A--6--Series 25 kV, Loadbreak 9U01B--5--Series
Cooper Power Systems	15 kV, Loadbreak SBT IV 2604600B Series with test point 2604599U Series without test point 25 kV, Loadbreak SBT 2604740B Series with test point 2604741B Series without test point
Elastimold (ESNA)	15 kV loadbreak Style 165LR, without voltage test point Style 166LR, with voltage test point Style 167LR, without voltage test point Style 168LR, with voltage test point 25 kV loadbreak Style 271LR, without voltage test point Style 272LR, with voltage test point Style 273LR, without voltage test point Style 274LR, with voltage test point 35 kV loadbreak Style 375LR, without voltage test point Style 376LR, with voltage test point
Joslyn	15 kV, Loadbreak LBT112M (without test point) LBT112TM (with test point) 25 kV, Loadbreak LBT262M (without test point) LBT262TM (with test point) 15 kV, Fused Loadbreak SPF-T (with test point)

U hq - Terminations, Multipoint

(Items on this page are rated for operation on three-phase systems and may be used on single-phase systems.)

Manufacturer	Catalog Number
Chardon Electrical Components	15 kV 2-way bushing 9U07A--2-0 3-way bushing 9U07A--3-0 4-way bushing 9U07A--4-0 25 kV 2-way bushing 9U07B--2-0 3-way bushing 9U07B--3-0 4-way bushing 9U07B--4-0
Cooper Power Systems	15 kV 2-way, 3-way,& 4-way bushings Series 2637172B with mounting bracket Series 2637164C without mounting bracket 25 kV 2-way, 3-way,& 4-way bushings Series 2637160B with mounting bracket Series 2637166C without mounting bracket
Elastimold (ESNA)	15 kV 2-way bushing, 163J2 3-way bushing, 163J3 4-way bushing, 163J4 25 kV 2-way bushing, 271J2 3-way bushing, 271J3 4-way bushing. 271J4 35 kV 2-way bushing, 373J2 3-way bushing, 373J3 4-way bushing, 373J4

U hq - Terminations, Feed-Through and Parking Bushings

Manufacturer	Catalog Number
Chardon Electrical Components	15 kV Feed-through, 9U07AKF200 Insulated Parking Bushing, 9U07ACF100 Grounded Parking Bushing, 9U07AAF100 25 kV Feed-through, 9U07BCF200 Insulated Parking Bushing, 9U07BCF100 Grounded Parking Bushing, 9U07BAF100
Elastimold (ESNA)	35 kV Feed-thru, 373FT Parking Bushing, 371SOP

U hq - Terminations, Multipoint

600 Ampere Continuous Current Rating

Manufacturer	Catalog Number
Cooper Power Systems	15 kV and 25 kV 2-way, 3-way, and 4-way bushings Series 2604670B (with mounting bracket) Series 2601496C (without mounting bracket) 35 kV 2-way, 3-way, and 4-way bushings Series 2637195C (with mounting bracket) Series 2637184C (without mounting bracket)
Elastimold (ESNA)	15 kV 2-way bushing, 650J2 or 675J2 3-way bushing, 650J3 or 675J3 4-way bushing, 650J4 or 675J4 25 kV 2-way bushing, K650J2 or K675J2 3-way bushing, K650J3 or K675J3 4-way bushing, K650J4 or K675J4

U hr - Secondary tap or splice cover, submersible

Manufacturer	Type or Catalog No.
Blackburn	Type WDBS (#2 through #4/0) Type DBS (250 KCMIL through 1000 KCMIL)
Connector Mfg. Co.	Utilug Sure Seal
Elastimold (ESNA)	Style 86
ESP	TSC Series
Homac	FSS Series
Kearney	Aqua-Seal Kit
Plymouth/Bishop	Splice-Wrap
Raychem	Rayvolve RVS Series
3M	PST Series 8420

Heat Shrink Tubing (with sealant throughout)

Manufacturer	Type or Catalog No.
AMP	Black heat-shrink tubing
CANUSA-EMI	CFW
ESP	HSH
Panduit	Heat shrink insulating cover and tubing
Raychem	WCSM cable sleeves
Sigmaform Corporation	Sigmaform heat-shrinkable products
3M	ITCSN tubular cable sleeve

U hv - Cable, Underground
15 kV and 25 kV Cable

Applicable Specification:	RUS Specification U-1
Conductor (15 kV):	Copper or Aluminum - #2 AWG through 1000 kcmil
Conductor (25 kV):	Copper or Aluminum - #1 AWG through 1000 kcmil
Insulation:	Crosslinked Polyethylene (XLP) (a) indicates Union Carbide 4201 XLP (b) indicates BP 521 XLP Tree-retardant Crosslinked Polyethylene (XLP-TR) (1) indicates Union Carbide 4202 XLP-TR (2) indicates BP H119Y XLP-TR (3) indicates BP H118Y XLP-TR Ethylene Propylene Rubber (EPR)
Neutral:	Copper Concentric Neutral
Jacket:	High Molecular Weight Polyethylene

Manufacturer	Insulation(s)	Flat Strap Neutral Available
Alcatel Canada Wire	XLP (a), XLP-TR (1), EPR	No
Cablec	XLP (a,b), XLP-TR (1,3), EPR	Yes
Conductores Monterrey, S.A. de C.V.	XLP (a), EPR	No
Condumex	XLP (a), XLP-TR (1), EPR	No
Hendrix	XLP (a), XLP-TR (1, 2, 3), EPR	No
Kerite	EPR	Yes
Okonite	XLP (a), XLP-TR (1), EPR	Yes
Pirelli	XLP (a), XLP-TR (1), EPR	Yes
Rome	XLP (a), XLP-TR (1), EPR	Yes
Southwire	XLP (a), XLP-TR (1), EPR	No

*For grounding purposes insulated jacketed cables must be treated like overhead lines, i.e., at least four ground rods must be installed per mile in accordance with the NESC. (This does not include service grounds, etc., but does include equipment grounds.) Additional grounding may be necessary in soils with higher resistivity or in sections where random separation is used. In splices or tap connections, a good seal should be achieved to exclude moisture.

U hv - Cable, Underground

600 Volt Cable

Applicable Specification: RUS Specification U-2
Conductor : Copper, #4 AWG and larger
Aluminum, #2 AWG and larger
Insulation : Cross-Linked polyethylene (XLPE)

Manufacturer	Type Conductor
ACPC, Inc.	Aluminum
Alcan	Aluminum
Alcatel Canada Wire	Aluminum
Cablec	Copper or Aluminum
Conductorres Monterrey, S.A. de C.V.	Copper or Aluminum
Condumex	Copper or Aluminum
Essex	Copper
General Cable	Aluminum
Okonite	Copper or Aluminum
Pirelli	Copper or Aluminum
Rome Cable	Copper or Aluminum
Southwire	Copper or Aluminum

NOTE: The manufacturers shown above have indicated that their 600 volt cable is suitable for use on 480 volt corner grounded delta circuits.

The above cable may be supplied with UL label for Type USE.

U hv - Cable, Underground

600 Volt Multi-Conductor Cable

Applicable Specification	:	RUS Specification U-2
Conductor	:	Copper, #4 AWG and larger Aluminum, #2 AWG and larger
Insulation	:	Cross-Linked polyethylene (XLPE)
Cable Configuration	:	3 Insulated Conductors Triplexed

Manufacturer	Type Conductor
ACPC, Inc.	Aluminum
Alcan	Aluminum
Alcatel Canada Wire	Aluminum
Cablec	Copper or Aluminum
Conductores Monterrey, S.A. de C.V.	Copper or Aluminum
Condumex	Copper or Aluminum
General Cable	Aluminum
Okonite	Copper or Aluminum
Pirelli	Copper or Aluminum
Rome Cable	Copper or Aluminum
Southwire	Copper or Aluminum

The above cable may be supplied with UL label for Type USE.

U hv - Cable, Underground

600 Volt Cable

(Alternative Cable Constructions)

Applicable Specification: RUS Specification U-2 (except as indicated below)

NOTE: Manufacturers listed below are conditionally accepted for alternatives A, B, and/or C for the products listed on pages U hv-3 and U hv-4.

Alternative A: 8000 series aluminum alloy in accordance with ASTM B800 or B801.

Alternative B: Stranding in accordance with ASTM B786 for aluminum 1350 conductors or ASTM B787 for copper conductors.

Alternative C: Abuse resistant (ruggedized) (single or two layer) insulation in accordance with ICEA P-81-570.

Condition: To obtain experience.

Manufacturer	Alternative
ACPC Inc.	(A)
Cablec	(C)
Pirelli	(C)
Southwire	(B) (C)

U hw - Warning sign

Applicable Specifications: RUS Drawings UM12-1 and UM12-2

Manufacturer	Size (inches)	Danger Sign Catalog No.	Caution Sign Catalog No.
Brady*	7 x 10	46133	46043
	10 x 14	46131	46041
Eastern Metal*	7 x 10	REA 12-1-710	REA 12-2-710
	10 x 14	REA 12-1-1014	REA 12-2 1014
	14 x 20	REA 12-1-1420	REA 12-2-1420
	20 x 28	REA 12-1-2028	REA 12-2-2028
Electromark*	7 x 10	REA-1-7x10-SV	REA-2-7x10-SV
	7 x 10	REA-1-7x10-AC	REA-2-7x10-AC
	10 x 14	REA-1-10x14-SV	REA-2-10x14-SV
	10 x 14	REA-1-10x14-AC	REA-2-10x14-AC
	14 x 20	REA-1-14x20-SV	REA-2-14x20-SV
	14 x 20	REA-1-14x20-AC	REA-2-14x20-AC
	20 x 28	REA-1-20x28-SV	REA-2-20x28-SV
	20 x 28	REA-1-20x28-AC	REA-2-20x28-AC
Lem	7 x 10	LSS-1400	LSS-1500
	10 x 14	LSS-1401	LSS-1501
	14 x 20	LSS-1402	LSS-1502
Lyle*	7 x 10	UM12-1-710	UM12-2-710
	10 x 14	UM12-1-1014	UM12-2-1014
	14 x 20	UM12-1-1420	UM12-2-1420
	20 x 28	UM12-1-2028	UM12-2-2028
May Advertising	7 x 10	MY710C	MY710B
	10 x 14	MY1014C	MY1014B
	14 x 20	MY1420C	MY1420B
	20 x 28	MY2028C	MY2028B
	For pressure sensitive decal add "D" prefix		
Truck Sign Service*	7 x 10	TSD-710	TSC-710
	10 x 14	TSD-1014	TSC-1014
	14 x 20	TSD-1420	TSC-1420
	20 x 28	TSD-2028	TSC-2028

*Reflective signs also available.

The signs listed on this page are to be secured to equipment and transformer enclosures by means of an adhesive or by welding. Screws and rivets are not to be used.

U hx - Cable Route Marker

Manufacturer	Catalog Number
Surface Mounted	
Chance	C554-0001
Above Grade	
W. H. Brady	BL1 (Decal on one side) BL2 (Decal on both sides)
Carsonite	REA-100
Chance	C554-0183
Electromark	REA-3-4x7-SV REA-3-4x7-AC REA-3-5x12-SV REA-3-5x12-AC
Flexstake	603 604 605 606
Greenline	FLU-78 (Decal on one side) DSU-78 (Decal on both sides)
Lyle	UM12-712
May Advertising	MY45A MY712A

For pressure sensitive decal add "D" prefix to catalog number.

Truck Sign Service	BCW-712

U hy - Splice, Underground, Permanent

(when ordering, specify conductor size, type, whether copper or aluminum and insulation diameter)

Manufacturer	Catalog Number
Chardon Electrical Components	15 kV Straight Splice through #1/0, Model 9U16A-100 "Uni-Matic" Through #2/0, Model 9U06A 25 kV "Uni-Matic" Through #2/0, Model 9U06A
Cooper Power Systems	15 kV 2637858U Series straight splice (No. 2 thru No. 4/0 stranded) 25 kV 2606825A Series straight splice 35 kV 2603934B Series straight splice
Elastimold (ESNA)	15 kv Style 1500S, straight splice, through #1/0 Style 25-S, straight splice, #2/0 through #4/0 Style 15PCJ-1, straight splice, through 4/0 Style 25-Y, Y-splice 25 kV Style K-25-S, straight splice Style K-25-Y, Y-splice Style 25PCJ-1, straight splice, through 4/0 35 kV Style M-250-S, straight splice
Joslyn	Type PMS152 Straight Splice (15 kV) #4 through #1/0
3M	Quick Splice/Quick Splice II, 5400 Series (15, 25, and 35 kV) 15 kV 5411R cable repair splice 5411R/HSJ-1 cable repair splice (for jacketed cable

U hy - Splice, Underground, Permanent

(When ordering specify conductor size, type, whether copper or aluminum and insulation diameter)

Manufacturer	Catalog Number
Raychem	15 kV HVS 1510-R____ 200 Amp Splice kit 25 kV For Bare Concentric Neutral Cable: HVS-2510-REAX in-line joint HVS-2510E-R-REAX repair joint For Jacketed Cable: HVS-2510-JCN-REAX in-line joint HVS-2510E-RJ-REAX repair joint 35 kV For Bare Concentric Neutral Cable: HVS-3510E-REAX in-line joint For Jacketed Cable: HVS-3510E-JCN-REAX in-line joint
Sigmaform	15 kV SSK Series (Heat Shrink)

U hy - Splice, Underground, Separable

(When ordering specify conductor size, type, whether copper or aluminum and insulation diameter)

Manufacturer	Catalog Number
Elastimold (ESNA)	15 kV Style 151-SR, receptacle Style 151-SP, plug Style 150-DP, deadend plug Style 150-DR, deadend receptacle Style 150-T, T-tap 25 kV Style K-151-SR, receptacle Style K-151-SP, plug Style K-150-DR, deadend receptacle Style K-150-T, T-tap

U hy - Splice, Underground, Permanent

(When ordering specify conductor size, type, whether copper or aluminum and insulation diameter)

600 Ampere Continuous Current Rating

Manufacturer	Catalog Number
Cooper Power Systems	15 kV 2604904B Series straight splice (MPS-600) 25 kV 2604905B Series straight splice (MPS-600)
Elastimold (ESNA)	15 kV Style 650-S, straight splice Style 15PCJ-2, straight splice, through 1250 MCM Style 650-Y, Y-Splice 25 kV Style K650-S, straight splice Style K650-Y, Y-splice Style 25 PCJ-2, straight splice, through 1250 MCM 35 kV Style M650S, straight splice

U ja - Transformer Flat Pad

Manufacturer	Catalog Number
Armorcast	600 Series*, Polymer Concrete
Associated Plastics	API 4000 Series RPM
Carolina Dielectrics	Model 0502-1, Fiberglass, Size:40"x44"
CDR Systems (Homac)	PP Series*, Fiber reinforced polymer concrete
Chance	C107-0162 Fiberglass, Size: 40" x 44"
Diversitech	TP Series - Fiberglass reinforced concrete
Electri-Glass	Fiberglass LP-4145, 41" x 45"
Electrical Materials	Molded HMW Polyethylene Model 64-3BC, 42" x 41" x 4" Model 65-4BC, 52" x46"
Electrimold	ELP
Fiberglas Fabricators	FFBPPC Series, Polymer concrete hybrid
Formex	Model TP-REA, Molded polyethylene
Heil Rotomold, Inc.	T Series*, High density polyethylene
Highline	HL-46B, Fiberglass, Size: approx.42"x42"
Major Frame-Crete	ETPP precast, cellular concrete, 42"x42"
Nordic	TP Series, Fiberglass
Quazite Corp.	Composolite - PH Series
RMI-D	Dwg. No. 730126-2, Molded polyethylene Size: 42" x 42"
Smith Cattleguard	Easi Set T. Series, Precast Reinforced Concrete
Thermodynamics	Poly-Pad, PR Series*, Molded polyethylene

*Order by catalog number and size.

U ja - Transformer Box Pad (Sleeve)

Manufacturer	Catalog Number
Acura Fiberglass Corp.	Model AG 4532
Associated Plastics	Transformer pad and box assembly, API 4242 RPM Pad and 1730 Box Transformer Pads, API 16 and API 45
Blue Grass Vault Company	BG-PV-T, BG-PV-1, BG-PV-2
Concast	Fibercrete modular bases
D & L	Fiberglass
Electri-Glass, Inc.	BP-2000
Electrimold	EBPT, EBPS, EGS Series
Fiberglas Fabricators	Transformer pad and sleeve assembly, FFBP series
Formex	Transformer pad and box assembly TP-REA Series Pad 1730-A Series Box
Highline	Box pad HL-45A, Size: L-43", W-34-1/2", D-32"
Malton	FGS Series Fiberglass ground sleeves and box pads
Maysteel	CW-GS-P Series
Mor-Tech Fab	Transformer pad ground sleeves
Nordic	GS Series Fiberglass
Thermodynamics	Poly Pad - VC series (VCC-P series covers available) Polyethylene

*Order by catalog number and size.

U jb - Splice Shield
(Refer to Drawing UM45-4)

Manufacturer	Catalog Number
Kellems	No. 014-03-1429

Conditional List
U sc(1)
July 1995

U sc - Regulators, voltage, pad-mounted
for underground distribution

12.5/7.2 kV

Manufacturer	Conditions
Siemens-Allis Single-phase, step-type pad-mounted regulator Type PFR (76.2, 114.3 & 167 kVA)	To obtain experience.

U sd - Current Transformers
600 Volt

Direct Burial Type

Manufacturer	Type or Catalog No.
General Electric	JAL-O

Indoor Type for Pad-Mounted Transformers

Manufacturer	Type or Catalog No.
ABB	CMV
G.E.C. Durham Industries (Astra)	AP
General Electric	JAB-O
Schlumberger	R6P

U si - Anodes, Sacrificial
(Drawings UM1,1-1, UM26, UM27, M2-7, M2-17)

Zinc Anodes*

	Pre-packaged With Connecting Wire			Bare Continuous Strip (Ribbon)	
	12 lbs.	30 lbs.	60 lbs.	5/8" x 7/8"	1/2" x 9/16"
Cathodic Protection Services	12HII-4A	30HII-4A	60HII-4A		
Federated Metals	S-12 packaged	S-30 packaged	S-60 packaged	Regular Size Type II	Junior size
Harco	AZC12GJ	AZC30GJ	AZC60HJ		
Mesa	S-12 packaged	S-30 packaged	S-60 packaged	Regular Size	Junior size
Stuart	SZ-12	SZ-30	SZ-60		
	-----VIBROX packaged-----				

*When ordering, specify zinc anodes that meet ASTM B418-73 Type II Composition and RUS Specification DT-9, "RUS Specification for Zinc Sacrificial Anodes."

U si - Anodes, Sacrificial
(Drawings UM11-1, UM26, UM27, M2-7, M2-17)

Magnesium Anodes**

	Standard Potential				High Potential			
	17 lbs	20 lbs	32 lbs	50 lbs	17 lbs	20 lbs	32 lbs	48 lbs
Cathodic Protection Services	AMH17A packaged		AMH32A packaged	AMH50A packaged	17D3 packaged	20D2 packaged	32D5 packaged	48D5 packaged
Federated Metals	17 packaged		32 packaged	50 packaged				
Harco	AMC17J	AMC20J	AMC32J	AMC50J	AMC17G	AMC20G	AMC32G	AMC48G
Kaiser Mag.	17 Vibra Pak		32 Vibra Pak	50 Vibra Pak	17 Electromag Vibra Pak		32 Electromag Vibra Pak	50 Electromag Vibra Pak
Mesa	17 packaged		32 packaged	50 packaged	17D Series	20D2	32D Series	48D5
Stuart	SM-17		SM-32	SM-50	SM-17H		SM-32H	SM-48H

**When ordering, specify magnesium anodes that meet RUS Specification DT-10, "RUS Specification for Magnesium Sacrificial Anodes."